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STEEL

The Magazine of Metalworking and Metalproducing

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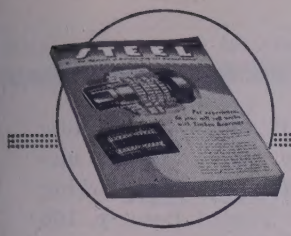

August 15, 1949

Incentive for Crusade

In the opening statement before the President's steel industry "fact-finding" board last Thursday Clarence B. Randall, president of Inland Steel Co., assailed the government's intervention in the steel dispute in forceful language.

He asserted that collective bargaining has been destroyed—repealed by the President—and that if the strategy employed by the union and the President works in this instance, "collective bargaining will never come back."

"When the President announced the formation of the fact-finding board," declared Mr. Randall, "he was in fact announcing an industrial revolution in America. By doing so he has declared himself as favoring a new social order and one so different from that under which our magnificent production record has been achieved that unless the process is stopped, and stopped at once, there will be no possibility of turning back. Through this means, whether he knew it or not, he has proclaimed that wages shall be fixed by the government. This step is always the first one taken by those who set out to establish a socialist or corporate state. The fixing of profits comes next and then when incentive is killed and production falls, the final step of nationalization follows."

While Mr. Randall was issuing this warning, the American public was digesting former President Herbert Hoover's 75th birthday address in which he warned that American posterity's birthright to liberty is in danger of being "bartered for a mess of collectivist system."

As if these warnings were not enough, dispatches from England described how British merchants are protesting the action of the Labor government in ordering a 5 per cent reduction in the prices of certain consumer goods. Here is actual proof that Mr. Randall's warning that government fixing of wages is but a step to government fixing of profits is justified.

This dispute over steel wages, which should have been left to existing machinery for collective bargaining, now may assume the importance of a national showdown as to how far President Truman and Mr. Murray will be permitted to go toward wrecking the country before they are stopped. The principles involved are important enough to warrant a massive crusade by right-thinking people against this Truman-initiated industrial revolution.

* * *

PRESSURE UPON PRICES: A significant straw in the wind is the widespread clamor for lower prices of the materials and parts that go into manufactured articles. Although the pressure for lower prices is particularly noticeable among purchasers for the automobile and appliance industries, it is by no means confined to them. Competition is forcing buyers in virtually every field to enlist in the crusade for reduced quotations.

Probably no one has a definite idea as to exactly how much prices should be cut. Judging from the talk of some buyers, there is a hope that cuts averaging around 10 per cent may be forthcoming. Of course this hope is tempered by the recognition by all purchasers that any decision by sellers to reduce prices at this time is complicated by the present labor crisis. Had the strike threat not arisen in several key industries, it is certain that current conditions of competition would have prompted more suppliers to have adjusted prices before now.

Aside from the urge of competition, argue those demanding lower prices, are the factors of greater productivity of employees, im-

(OVER)

proved production methods and lower prices for some materials. However, timing enters into the last named factor. Prices of some nonferrous metals have turned upward and the traditionally sensitive iron and steel scrap market is showing signs of firmness.

A possible outcome of this confusing array of influences is that the longer any general price reductions are delayed, the less likely they will take place. —pp. 61, 143

* * *

OIL DEPENDS ON STEEL: Ninety years ago this month, the infant American petroleum industry, which bloomed overnight after Edwin Drake struck oil near Titusville, Pa., scarcely could have been called a promising customer of the iron and steel industry. The initial impact was chiefly a boon to the cooperage industry.

Today a large part of the petroleum industry's expenditures for expansion goes to the iron, steel and metalworking industries. In 1949 the emphasis is on refining, transportation and marketing and it is expected expenditures will equal or exceed the $562, $300 and $206 million, respectively, spent in these three divisions of activity last year. In refining, new methods to process residual or heavy oils are stimulating the demand for heavy equipment. In transportation, an ever-increasing proportion of petroleum gallonage is being moved by pipeline. In marketing, oilmen are banking on an increase in storage tank facilities as the chief means of cutting distribution costs.

Everything points to a continuing strong demand for steel and equipment from the petroleum industry. —p. 63

* * *

ALERT EYES AND EARS: An excellent article in this issue, which explains how a carefully planned lubrication program yields multiple benefits, contains the following interesting paragraph:

"The day when shop flunkies who could not read or write are selected for oilers is fast approaching an end. Oil company reports show that industrial management is increasingly realizing that oiling personnel are the most valuable 'eyes and ears' in the plant. They can, if properly trained, catch mechanical troubles in the incubation stage and prevent serious and expensive maintenance later. This is an all-important by-product of routine oiling duties."

This article outlines seven important steps that are essential to a successful planned lubrication program. Included in this tested procedure are numerous suggestions regarding often neglected details which, if followed carefully, undoubtedly would insure more efficient machine maintenance in hundreds of metalworking plants. —p. 106

* * *

STEEL DEMAND SHIFTS: Now that the supply of steel has overtaken demand, noticeable changes in the pattern of product distribution are developing. Statistics compiled by the American Iron & Steel Institute for the first half of 1949 show that in percentage of total shipments, shipments of ingots and semifinished steel are declining, those of plates have turned down after a rise through May and those of cold-rolled and galvanized sheets are mounting steadily.

These changes reflect the natural adjustments which follow a period of scarcity. The elimination of demand for conversion steel accounts for the drop in ingots and semifinished. Collapse of freight car construction contributed to the reversal of trend in plates. The improved status of cold-rolled sheets is due largely to heavy buying by the automobile industry. The more generous supply of steel generally has permitted mills to meet the consistent strong demand for galvanized sheets more satisfactorily. —p. 72

* * *

BARGE TRAFFIC TRIPLES: When the basing point system was abandoned last summer, numerous commentators predicted that one of the results of that action would be a shift in traffic from rail to inland waterways and highway trucking.

This prediction is proving true. Barge operators estimate that during the past year the movement of materials on the rivers in the Pittsburgh district has tripled and that much of this increase has been due to heavier shipment of steel. Also the area served by water shipments has been extended. Steel from Pittsburgh has been barged as far west as Kansas City and as far north as Minneapolis. Several weeks ago the first barge cargo of steel was shipped from Pittsburgh to Chattanooga.

Shipment of steel by barge requires more handling than tonnage shipped by rail, but barge rates are much lower than rail rates. Rate from Pittsburgh to Chattanooga is $17 to $18 per ton by rail against $5 to $6 by barge. —p. 66

E. L. Shaner

EDITOR-IN-CHIEF

News Summary

STEEL RESISTS— What may be the beginning of a large-scale resistance to a trend toward state socialism was heard in the steel industry's keynote presentation (p. 64) before the fact-finding board hearing the steel wage dispute last week. Industry spokesmen told the board that the method of handling the dispute may mean the end of collective bargaining forever. They warned that government fixing of wages was the first step toward a corporative state, that it might be followed by profit-fixing, which would kill industry's incentive and result in lowered production. That would open the way for nationalization, as it has in many European countries . . . . Meanwhile, metalworking companies must await the outcome of the steel case to learn what demands the unions will make against them.

PRESSURE ON PRICES— Buyers of materials and components are putting the heat on their suppliers to lower prices (p. 61). Goal appears to be about a 10 per cent cut. The pressure on materials and parts may presage reductions in finished products this autumn.

STEEL DISTRIBUTION— Declining demand for steel has changed the pattern of steel distribution during the first six months this year (p. 72). Demand for ingots and semifinished, important items during the steel stringency, has been cut in half. Cold-rolled and coated sheets are accounting for a greater percentage of the total. Drop in freight car construction has caused plate demand to fall.

EXPANSION IN OIL— Petroleum industry is spending $2 billion on improvements this year to help cut costs for a buyers' market (p.63). New business is accruing as a result to metalworking firms producing oil refining, transportation and marketing equipment. Kaiser Steel Corp. is entering the market through a sales and manufacturing agreement with Basalt Rock Co., Napa, Calif., whereby Basalt will add facilities to produce pipe.

JOBLESS RISE IS SLOWER— Unemployment is rising but at a slower pace (p.65). Leading employers in Cleveland and other cities estimate that joblessness will increase until yearend and then level off or decrease slightly. The government plans to funnel its spending and lending programs into those areas where unemployment exceeds 12 per cent of the total labor force.

STEEL SHIPPED BY WATER— Steel shipments from the Pittsburgh area by way of the Ohio and Mississippi rivers are gaining rapidly as producers seek to overcome the constrictions of f.o.b. mill pricing (p.66). Tonnages have moved by water to points as far from Pittsburgh as Kansas City and Minneapolis.

EUROPE— European industrial activity is edging upward in spite of the financial and diplomatic crises brought by revelation of Britain's economic position (p. 71). Among the factors causing a mild surge in demand are: Clarification of currency exchange problems, strong sales efforts, falling prices and end of nearly all materials shortages.

HERE AND THERE IN INDUSTRY— U. S. steel output in July, at 5,070,777 tons of ingots and castings, fell to the lowest total for any month since December, 1946 (p. 66) . . . Canada's steel operations are near capacity, and good demand is expected for the next three years (p.67) . . . The strike poll of Ford's 77,000 Michigan workers cost state taxpayers $20,000 and gave the union a little more pressure to use in contract negotiations (p. 75) . . . Building Research program of National Research Council is held as a fine example of co-operation between private industry and government (p. 68) . . . Kaiser is closing its Portland, Oreg., shipyards (p.67) . . . New Pacific Coast Division of Revere Copper & Brass Inc. is in full operation making copper and copper alloy rod and tube (p.78) . . . Utah Supreme Court has ruled that U. S. Steel Corp. need not pay the $423,526 sales tax for the Geneva, Utah, mill (p.66) . . . Slow-moving home financing machinery is responsible for stalling distribution of prefabricated home, says Lustron Corp. (p. 73).

Engineering News, p. 89 *Market Summary, p. 143*

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STEEL
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Pulse of Business Strengthens

Completion of inventory reductions and buying in protection against steelworkers' strike brings early, although perhaps only temporary, halt to business downtrend

THE PULSE of business is beating a little stronger, a little faster. With this rally is an increase in optimism.

The improved condition business observers had predicted for this autumn apparently has arrived ahead of schedule. Most prognosticators had picked September as the time for upturn. The timetable has been upset by threat of a steelworkers' strike.

Prevalent is a belief that a considerable portion of the increased business being packed into the remaining four weeks before a possible steelworkers' strike will be at the expense of the fourth quarter.

Responsible for a substantial portion of the current upsurge in new ordering — particularly of steel — is the automobile industry, which is laying in material to tide it over the threatened steelworkers' strike.

Geared to Consumption—All of the upturn cannot be attributed to this protective buying, however. Numerous consumers are placing small orders for immediate delivery, indicating completion of inventory reductions and the gearing of new buying close to actual consumption. Also stimulating consumers to buy steel now if they need it is the conviction that there will be no immediate decline in steel prices.

Completion of inventory reductions and buying in protection against a steelworkers' strike pushed the nation's steel ingot production rate up one point further last week to 82.5 per cent of capacity. Among companies feeling the upsurge is Republic Steel Corp., Cleveland, which reveals tonnage now involved in new orders is 2½ times greater than the low level in early July. New order tonnage again exceeds shipments. Strengthened demand for steel pushed Republic's alloy steel production, one of the first to feel the business recession, higher than it has been for several months. The company is not optimistic about prospects for continuation at the new level, however, for part of the stepup in production was made to permit deliveries before mid-September in anticipation of a strike. If a strike does not occur, the auto industry is expected to cut down sharply on buying and work off its inventory.

On the employment front, conditions are mixed. Some companies continue to lay off employees while other firms are calling back workers.

Pressure on Prices

Suppliers to auto, appliance manufacturers asked to trim quotations. Goal: 10 per cent cut

IN BIG DEMAND today are lower prices on products that metalworking companies supply to industry. Spearheading the drive for markdowns is the automotive industry — the nation's No. 1 consumer of steel and components—but also figuring prominently in the move is the appliance industry.

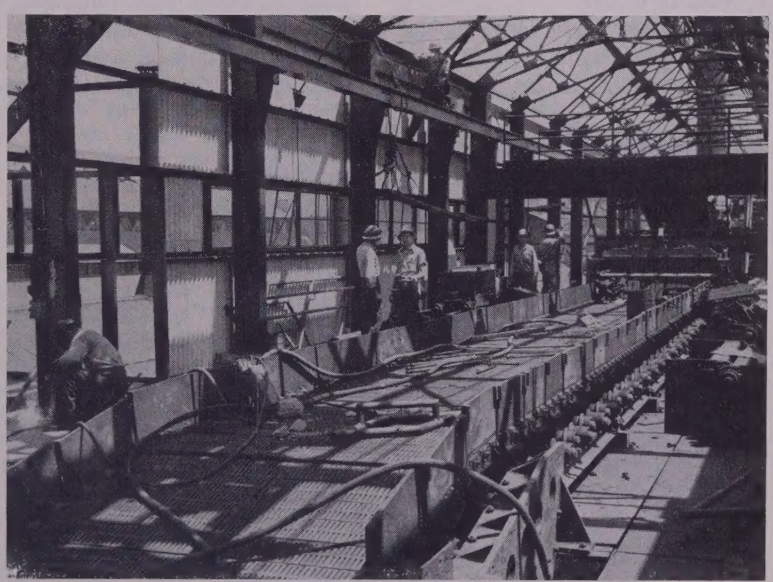
Can reductions be made? Purchasing agents think so, hope so. Some metalworking company executives say they can't make any cuts, others say they can.

How much of a cut? Reports indicate automakers in some instances are trying for as much as 20 per cent but the average goal seems to be around 10 per cent, although the effort thus far appears to be aimed not at a specific percentage but at whatever reductions can be gained.

With the auto industry's net earnings in the second quarter of 1949 higher than in the first quarter and with auto demand and production still at a high level it would appear that the present earnings position of that industry is not stimulating the drive for lower prices on parts. Therefore, some observers have deduced that the auto companies "see some handwriting on the wall" and are girding themselves for the day when they will have to cut car prices to get business.

Competition Stiffens—The drive for lower prices comes at a time when competition for business has stiffened. As a result, metalworking companies are quite heedful of pressure for price cuts and are exploring all means for increasing business.

Even though labor rates are high



ORE CONSERVATION: Steel conveyor line at National Works of National Tube Co., McKeesport, Pa., is part of the new ore conservation program announced by U. S. Steel Corp. Project involves construction of five modern sintering plants at basic steel plants of subsidiary companies in the Pittsburgh and Chicago districts. Plants will process powdery iron ore to usable size and will recover iron from blast furnace flue dust

and threaten to become even higher, some metalworking companies feel they are in an increasingly better position to make at least some concessions in prices. Factors they cite as aids are: 1. Lower costs of steel; 2. increased productivity of employees; and 3. improved production methods.

While base prices and extras on steel have not changed much, the increased availability of steel has made it possible for consumers to buy under more economically advantageous conditions. No longer do consumers find it necessary to buy conversion steel, to pay premium prices, to take material not properly suited for the job, and to buy at distant mills with resultant high charges for transportation. With secondary quality steel in better supply, some stampers are finding this product a help too in cost-cutting.

Productivity Higher — Increase in worker productivity is stemming from the recent rise in unemployment. One midwest stamping company, for example, reports its employee productivity has gone up 10 per cent. On the other hand another stamping company whose business has fallen off said its tool and die workers were slowing down in order to "stretch the work."

As an example of improved production methods, one stamping company is driving hard to find shortcuts in processes. In such a drive, another stamper, manufacturer of steel kitchen cabinets, has combined 34 operations in one.

A stamper serving a large maker of home appliances has been able to pare prices of stampings from 1 to 15 per cent, depending on the particular item.

Quality Conscious — While faced with pressure for lower prices, suppliers also are noticing demand for higher quality. To stress importance of quality and to discuss what's new in standards of quality and quality control techniques, General Electric Co.'s plant at Erie, Pa., held a conference of its suppliers the last week of July.

In another event GE's Bridgeport, Conn., plant assembled a display of all of the stampings it uses and invited stamping companies to look it over and bid on the items they were best fitted for making. The result? Lower prices to GE for stampings.

Power Project Orders Placed

POWER project orders are stepping up the sales voltages for three equipment producers.

Dravo Corp. has been awarded the contract as construction agent for the $28 million power plant of Duquesne Light Co., Pittsburgh, to be built at Elrama, Pa. Construction on the plant will be started early next year and finished in 1952.

Westinghouse Electric Corp. has received a $400,000 contract to build an 83,333-kva transformer to be mounted permanently on a railroad car for the Bonneville Power Administration.

Baldwin Locomotive Works has received an order from Tennessee Valley Authority to build the fourth and last 42,000-hp hydraulic turbine for the Chickamauga Dam. Delivery is set for August, 1951. Baldwin has built or has on order a total of 27 turbines for TVA. The last turbine for Wheeler dam is under construction in the Baldwin shops.

CHEAP PACKAGE: Harshaw Chemical Co., Cleveland, has solved the problem of shipping anodes with a cheap, simple palletizing arrangement to be thrown away after use. Anodes are placed in holding jig; corrugated board is placed above, below and between anodes; and steel strap, threaded through holes in skid, is brought up tight

Inventories Fall by $1 Billion

BUSINESS inventories dropped by more than $1 billion from May 31 to June 30 to an estimated book value of $51,579,000,000. At June 30, 1948, inventories were $51,317,000,000. This is the third straight monthly decline since a high of $54.8 billion was recorded in March.

Philco TV Sales Best in History

SALES of the 1950 Philco television receivers "are greater than in any other period of the company's history," says James H. Carmine, executive vice president. Television prospects for the rest of 1949 are excellent. The radio and radiophonograph business this fall "will exceed all predictions."

Motorola Hires 1000 More

MOTOROLA Inc., Chicago, is hiring 1000 additional workers, bringing its total to 4500, the highest number of radio and television employees in its history. Company says its business prospects for the rest of this year and into 1950 are "very favorable."

June Washer Sales Year's Tops

JUNE factory sales of standard-size household washers totaled 272,200 units, highest month's volume of the year, 27.2 per cent more than in May, but 29.6 per cent below June, 1948, figures.

Ironers sold in June totaled 20,600 units, 8.4 per cent over May, but 37.1 per cent under June, 1948, levels.

Westinghouse To Rehire 850

WESTINGHOUSE Electric Corp. will rehire 550 Aug. 22 at its Mansfield, O., plant and 300 by Sept. 1 at its Springfield, Mass., facility. Increased consumer buying of refrigerators and other home appliances necessitates greater production at both plants.

Budd Employment, Deliveries Up

INCREASED production in Budd Co.'s automotive plants has boosted employment by 1571 persons or about 8.3 per cent over a year ago. Deliveries of auto parts are averaging $21,742,507 monthly, compared with $14,638,384 monthly at this time last year.

xpansion in Oil

Benefits firms making refining, distribution equipment. About $2 billion being spent

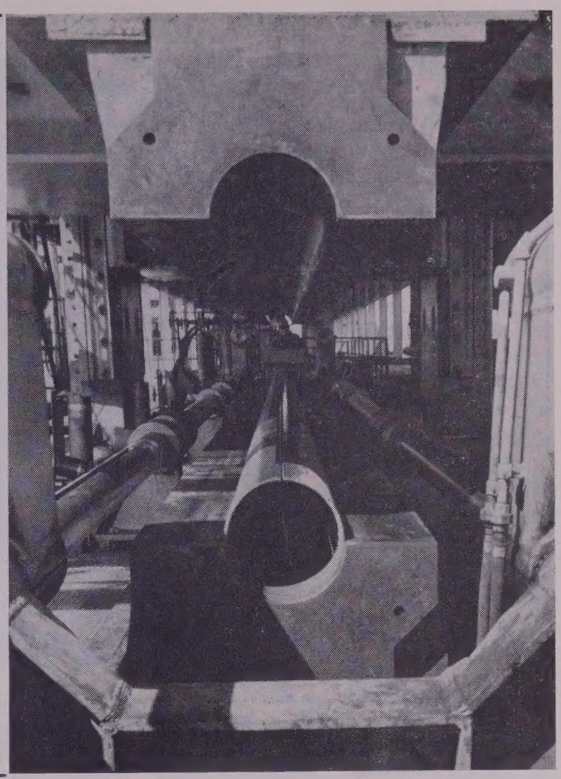
INETIETH year of the oil indus-y finds it spouting good health s far afield as the metalworking isiness, a major beneficiary of pe-oleum's $2 billion expansion and nprovement program to cut costs or a buyers' market. The American etroleum industry had its begin-ings on Aug. 27, 1859, when Col. Edwin Drake brought in the nation's irst commercial oil well.

Last year, oil's capital expendi-ures totaled about $2.6 billion to omplete the principal postwar ex-ansions. The 1949 figure will nearly qual 1947 expenditures and will al-ost double the annual average for 942 through 1946. Of last year's apital allotments, $1.5 billion went nto crude oil production. This year he emphasis is on refining, transpor-ation and marketing. Last year's 562 million expansion of refining acilities, $300 million for trans-ortation and $206 million for mar-eting will be equaled or exceeded.

Refining—Major cost-paring oppor-unity in refining lies in develop-ent of new methods to process resi-ual or heavy oils. This grade is ow in oversupply because coal is enerally a cheaper industrial fuel nd because heavy oil output has isen as a result of greater produc-ion of gasoline and light fuels. A "coking" process which cracks the esidual oil into coke and lighter uels has been developed and used or some years, but this method is eing improved. Modifications nec-ssary in coking plant equipment al-eady installed promise a business purt for makers of refining appar-tus. New coking installations have een begun by General Petroleum Corp., (STEEL, Aug. 8, p.41) and ther firms. Entirely new process o refine residual oil directly to asoline and light fuels are being eveloped by Union Oil Co.

Transportation—Pipelines are get-ing the emphasis in transportation xpansion. About 150,000 miles of ipeline, 25,000 miles more than a ear ago, carry oil all over the U.S. f the 4,818,000 barrels of crude eceived daily by U. S. refineries, ,816,000 barrels arrive by pipeline.

Marketing—Oilmen are banking on n increase in storage tank facilities s the chief means of cutting mar-eting costs. A national program is n progress to increase the size of nderground tanks at gasoline ser-ice stations.



ONE-MAN OPERATION: Alignment of welding edges is shown in the 40 ft section of Basalt Kaiser pipe that has just been pressed into circular shape by the main forming press at the Basalt Rock Co. plant in Napa, Calif. Designed and built by Basalt, the press can be operated by one man. To remove oil or foreign matter, pipe is washed in an alkali prior to entering the welding machine

To Produce Big Pipe

Kaiser and Basalt reach manufacturing and sales pact to produce electric fusion pipe

KAISER STEEL Corp., Oakland, Calif., and Basalt Rock Co., Napa, Calif., have made a manufacturing and sales agreement whereby Basalt will add facilities to produce electric fusion weld steel pipe up to 36 inches. The company now produces standard sizes of pipe from 8⅝ to 20 inches. Plate for the large diameter pipe will be supplied by the Kaiser Fontana mill. Kaiser will market the pipe under the label "Basalt-Kaiser."

Henry J. Kaiser, president of Kaiser, and A. G. Streblow, president of Basalt, explained that postwar growth of the West Coast and Middle West has produced an increasing demand for gas and oil pipe. They think that the pipe line industry will require huge amounts of steel pipe in the next few years.

Under the agreement production at Napa of pipe from 8⅝ inches to 20 inches will be increased through the installation of a Yoder electric resistance welding unit early in September. There is only one other manufacturer of large diameter steel pipe west of Milwaukee.

Meanwhile, Kaiser is building an electric weld mill at Fontana to produce pipe in sizes ranging from $5\frac{9}{16}$ inches to 14 inches. When expansion of both companies has been completed Kaiser and Basalt will be able to offer pipe ranging from ½ inch to 36 inches.

Pipeline Contract Awarded

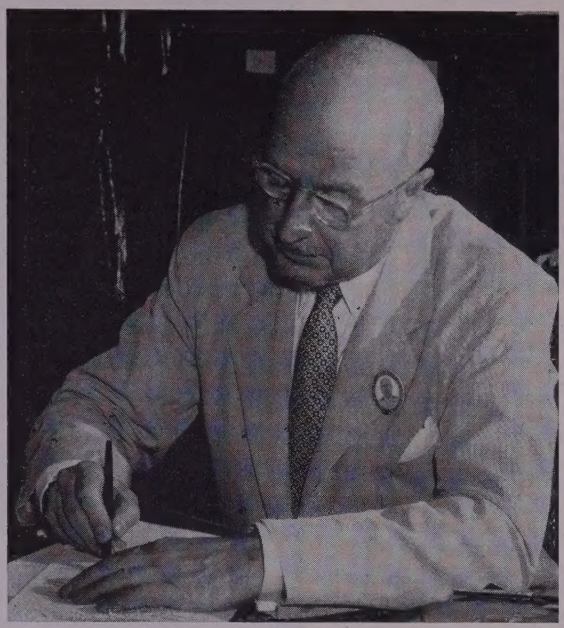
CONTRACTS have been awarded in St. Louis by Mid-Valley Pipeline Co., owned jointly by Sun Oil Co. and Standard Oil Co. of Ohio, for construction of a 1000-mile crude oil pipeline from Texas to Ohio. The 20 and 22-inch diameter pipe will make the line one of the largest crude oil carriers in the nation. It will be operated as an interstate common carrier, originating around Longview, Tex., and ending in Lima, O.

Pipeline will require an investment of about $56 million. Contract for construction of section from Longview to Haynesville, La., will not be awarded until early 1950 when bids for it will be reopened.

Humble Pipe Line Co., subsidiary of Humble Oil Co., Texas affiliate of Standard Oil Co. of New Jersey, has announced plans for an $18 million pipeline from western Texas to the Gulf Coast.

FPC Authorizes Construction

FEDERAL POWER Commission has authorized Kansas-Nebraska Natural Gas Co. Inc., Phillipsburg, Kans., to increase its transmission facilities. Capacity of the company's system would be brought to 140 million cubic feet per day. Estimated cost of the construction is $2,339,457.



"NON RED" OATH: William E. Umstattd, president, Timken Roller Bearing Co., filed the first company non-Communist affidavits with the government. National Labor Relations Board accepted affidavits as evidence of good faith. Several unsuccessful moves have been made in Congress to require oaths from employers as well as unions

Steel Men Charge Collective Bargaining Destroyed

Procedure forced by union and President may mean government wage-fixing forever, says Randall

COLLECTIVE bargaining has been destroyed. President Truman and the United Steelworkers in attempting to force a settlement of the steel wage dispute through a fact-finding board may commit the country to government wage-fixing forever.

This was the steel industry's keynote before the fact-finding board hearing the steel wage dispute in New York.

Said Clarence B. Randall, Inland Steel president: "If this union strategy works this time, collective bargaining will never come back."

Some observers see the industry's presentation as the beginning of concerted resistance to a trend toward state socialism.

Mr. Randall pointed out that the union wage increase demands were never brought to the bargaining table, were first disclosed before the board. "It is now clear that at no time did the union actually intend to come to an agreement with us. We were but an insignificant part in the working out of the global strategy by which the establishment of this board was to be forced . . ."

The steel men told the board they would oppose the fact-finding board method of settlement even if the board "would deny each demand of the union, as statesmanship requires you to do.

"No increase in cost whatever should take place at this time. To increase cost in a falling market is to invite disaster. Rising costs inevitably bring lower volume and unemployment . . . The battle now is to maintain production, and industry needs lower costs, not higher."

Workers Grow Restive

STALEMATE in new contract negotiations in steel, auto and other metalworking industries is causing scattered interruptions or slowdowns of production. Unauthorized strikes, generally for trivial grievances, are more frequent. Worker productivity, which has been increasing in recent months, tends to decrease in those plants where workers are preoccupied with the outcome of pending wage negotiations. Employees tend to resist supervision as strike talk increases. Union membership checks are more frequent, sometimes are marked by violence.

Last week nearly a score of walkouts were reported caused by hot weather. Many of these occurred in auto and auto parts plants.

American Bridge Co. at Gary, Ind., was shut down for a day and a half when 110 workers in the shipping department stayed away from their jobs and picketed the plant. No formal grievance was filed and the workers returned Aug. 10.

Gary Sheet and Tin Mill of Carnegie-Illinois Steel Corp. lost 11,750 tons of output when 2500 workers staged a 2-day memorial strike aft a workman was fatally injured a coil rolling from an interpla railroad car.

A dues checkup at Republic Stee Chicago plant required police inte vention.

At Pittsburgh, 700 workers Pittsburgh Screw & Bolt Co. we idled by an unauthorized walkout protest to what the union term company delay in making paymen under a reclassification and inequi elimination program.

Nonbasic Contracts Extended

METALWORKING companies havir contracts with the United Steelworl ers-CIO will have to await settl ment of the basic steel wage ca before they learn what demands t union will make against them.

Companies whose contracts expir before July 16, when the basic ste case was turned over to the Pres dent's special fact-finding board, ge erally have reached agreement wi the union to extend the contrac until after the basic steel case resolved.

Companies whose contracts ha expired since July 16 have bee asked to agree to "co-operate" "go along" with the President's pr posal in the basic steel case in r turn for a contract extension. Ex tensions in most case run to Sep 14, although some run into or throug October.

Extensions for companies not agre ing to go along with the President proposals are on an indefinite basi Plants are likely to be struck wit out notice. One such strike was i effect in the Pittsburgh district la week, largely because the union didn like the company's attitude.

Parkersburg Steel Co., Parker burg, W. Va., struck Aug. 1 for r luctance to follow the procedure ou lined by the union and the Presiden was reopened when the union reco sidered its case and decided Parker burg was not a basic steel produce

Reject Fourth Round Demands

MAJOR electrical equipment manu facturers last week iterated thei opposition to fourth round wage de mands and restated their intention of standing pat on present rates.

Westinghouse Electric Corp. tol its 90,000 employees that it woul not be influenced by any increase which might be granted in the ste or auto industries.

"Whatever may be done in othe industries . . . will not change West inghouse's problems and circum

ances. Therefore, management ust continue to hold to its conclu-n that a fourth round increase ould not be paid.

General Electric Co. faces a strike reat from the CIO electrical orkers as result of its consistent position to the union's fourth round mands. The union says its mem-rship is being mobilized "for even-al strike action."

In reply, the company said: "We e no reason now why a strike reat should change the decision ost carefully arrived at by the com-any on the basis of the facts."

The UE-CIO is demanding wage ncreases, work-week reductions, ension and insurance improvement nd other benefits to total $500 per orker per year.

Union Accepts Wage Cut

WAGE reducton of $3.08 a day has een accepted by the United Cement, Lime & Gypsum Workers Union-AFL n a contract signed with Eagle-Picher Mining & Smelting Co. A new abor contract running until Apr. 0, 1951, provides for a sliding wage cale reducing rates $3.08 a day. This scale will hold until zinc price eaches 10.50 cents a pound, East St. Louis. Thereafter for each in-rease of 1 cent a pound in the price f the metal, the wages of the work-rs will be increased 6.43 cents an our.

Retired? Join the Club

RETIRED employees of the Farrel-Birmingham Co. Inc. were provided with a two-room club when the An-sonia, Conn., machinery firm con-verted a former pattern shop into new quarters. At a dedicatory luncheon Franklin Farrel Jr., director of the company, presented member-ship cards for the "Farrel-Birming-ham Retired Employees Club." Club rooms have deep cushioned, leather-upholstered chairs and lounges, well supplied book shelves and table-game paraphernalia for passing time pleasantly.

Steel Payroll Increases

PAYROLL in the steel industry for the first half of 1949 is estimated at $1,161,000,000 by American Iron & Steel Institute, an increase of $107 million over the first half of 1949. The total, which excludes payrolls in nonsteelmaking operations, is high-er than in any first half on record. It is higher than the payroll for all of 1940 or any preceding year.

Steel industry employment in June was 624,500, a decline of 2 per cent from May and 1.4 per cent from June, 1948. Average hourly earn-ings of wage earners in June were 168.4 cents, 1.3 cents less than in May but 11.5 cents higher than in June, 1948. Wage earners average hours of employment in June in-creased to 37.6 hours a week from 37 hours in the preceding month.

Jobless Rise Is Slower

Unemployment may hit plateau or decrease slightly by next year, employers estimate

UNEMPLOYMENT is rising, but at a slackening pace.

In Cleveland and other cities a survey of major employers indicates that the rise in unemployment will slow to a halt by yearend and that general unemployment, at a postwar high of 4,095,000 in July, may de-crease slightly by next year. The accompanying chart shows United States employment trends over the past two decades.

Federal Aid—Areas with 12 per cent or more of their available work-ers unemployed are likely to get top priority under the administration's program to funnel government spend-ing and lending into "distressed" re-gions. The latest federal survey shows that only nine of the 98 areas are in this distressed category: Knox-ville, Tenn.; Muskegon, Mich.; Scran-ton-Wilkes Barre, Pa.; Utica-Rome, N. Y.; Waterbury and Bridgeport, Conn.; Providence, R. I.; and Wor-cester and New Bedford, Mass.

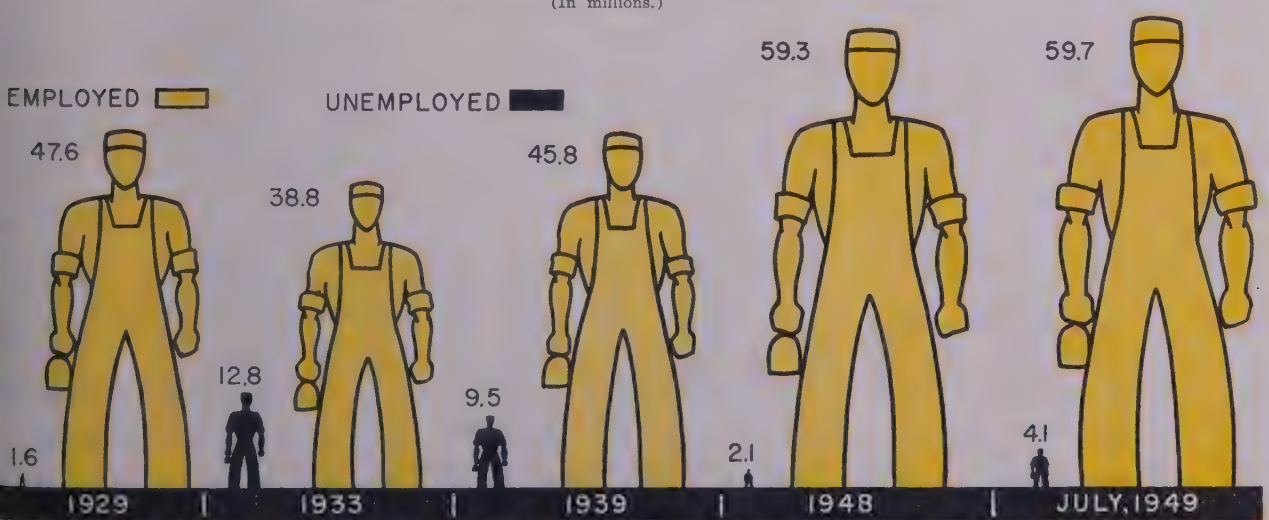
Furloughing of workers—chiefly metalworking—from industry and entrance into the labor market of the last large crop of veterans from schools and colleges accounted for most of the gain in unemployment. The labor force, at 63,815,000 in July, increased because of the normal in-crease in population and high school and college graduates.

Skilled labor categories which last year were tight, but which now are easy include electricians, milling ma-chine operators, tool and die makers, foundry, steel mill and construction workers. Skilled classifications which still are tight include riggers, refrac-tory bricklayers, boilermakers and blacksmiths.

Workers Recalled—Petroleum, con-struction, food and garment indus-tries have been recalling personnel earlier laid off, but few new workers have been added. These lines and agriculture account for the rise in employment to 59,720,000 in July from 59.6 million in June.

Ohio State Employment Service finds that in white collar groups its files of jobseekers are heaviest for beginning salesmen, salesmen for in-dustrial items and personnel men.

Employment Situation Over the Past 20 Years
(In millions.)



Source: Bureau of Labor Statistics, U. S. Department of Commerce. "Employed" figures do not include Armed Forces personnel.

More Steel by Water

Barge shipments from Pittsburgh district gain. Move far as Kansas City and Minneapolis

STEEL shipments from the Pittsburgh district by way of the Ohio and Mississippi rivers are gaining rapidly as producers seek a way around the constrictive effects of f.o.b. mill pricing. Since abandonment of the basing point system last summer, tonnage of steel moved by barge has risen steadily.

Exact monthly figures are not available; formerly government statistics were available monthly, but this service was discontinued. Barge operators, however, estimate that over the past year the movement of all materials on the rivers in the Pittsburgh district has tripled, and much of this increase has been due to heavier shipment of steel.

Until a year ago the northbound movement of petroleum, chemicals, etc. by river far surpassed the southbound movement of materials by river. Today, however, the southbound movement—a large part of it steel—is about equal to that northbound. This reflects larger steel shipments and a falling off in northbound tonnage of petroleum, chemicals, etc.

Shipping Area Extended — Steel from Pittsburgh has been moving by river as far west as Kansas City, Mo., and as far north as Minneapolis over past months. Only within the last several weeks the first 500-ton barge cargo was shipped from Pittsburgh to Chattanooga, Tenn. This was made up of less than barge load lots for more than one customer and included sheets, wire and miscellaneous products. The 1300-mile shipment from Pittsburgh took about two weeks for delivery. Other such mixed barge shipments are contemplated.

Barge shipment of steel requires more handling than tonnage shipped only by rail but the lower barge rates are said to more than offset the higher handling costs. On shipments to Chattanooga, for instance, say barge operators, cost of shipping by rail is $17 to $18 per ton as against $5 to $6 by barge.

Add River Terminals—Installation of additional river terminals, warehouses and handling facilities is contemplated, but probably it will be some time before such work actually is undertaken. In fact, it is pointed out, much will depend on final disposal of the freight absorption question still being debated in Congress. Should it become certain f.o.b. mill pricing is here to stay, undoubtedly both river and truck movement of steel will be stimulated on a scale undreamed of a few years back.

Significant development of inland waterways was the opening of the Corpus Christi to Brownsville, Tex., extension of the Gulf Intracoastal Waterway on the Rio Grande river, a deep navigation waterway connecting Mexico, the United States and Canada. A most important link in this system, according to Chester C. Thompson, president, American Waterways Operators, Washington, is that which connects the Mississippi-Ohio-Illinois river system to Texas cities and Mexico. Canada now can be reached via the Illinois deep waterway and Lake Michigan through the port of Chicago.

Steel Production Down Sharply

STEEL PRODUCTION in July fell sharply to the lowest total for any month since December, 1946, when a coal strike handicapped operations. American Iron & Steel Institute reports total output of ingots and castings during the month was 5,780,777 net tons, an 11 per cent decline from the revised June total, and 18 per cent below July, 1948.

Operating rate in July was 70.9 per cent of capacity, compared with 82.2 per cent in June, 88.8 per cent in July, and 101.5 per cent in the first quarter of 1949. Average for the first half of the year was 96 per cent. Peak of 102.7 per cent of capacity was reached in March.

Rail Freight Rates Go Up

TRANSPORTATION COSTS to business went up again when the Interstate Commerce Commission last week approved a freight rate increase averaging 3.7 per cent.

The commission's decision continued a 5.2 per cent general average increase put into effect early this year and added the 3.7 per cent. The railroads had asked for an average increase of 13 per cent over freight rates of last year.

Last week's increases were granted on a regional basis, the percentage raises varying as to region. Those boosts will total $288 million. In addition railroads are allowed an additional $5 million on other charges.

Geneva Sales Tax Ruled Out

THE UTAH supreme court has ruled four to one, in favor of Geneva Steel Co.'s contention that sale of the Geneva mill by the U. S. Government to U. S. Steel Corp. is not subject to the Utah sales tax.

The sales tax would have amounted to $423,526 if the levy had been up

Steel Ingot Production Statistics

	Estimated Production—All Companies									
	Open Hearth		Bessemer		Electric		Total		Calculated weekly production	Number of week
	Net tons	Per Cent of capac.	Net tons	Per Cent of capac.	Net tons	Per cent of capac.	Net tons	Per cent of capac.	Net tons	in mo
1948										
Jan.	6,770,831	95.6	343,263	77.5	366,784	80.2	7,480,878	93.7	1,688,686	4.4
Feb.	6,247,491	94.4	340,689	82.3	359,837	84.2	6,948,017	93.1	1,678,265	4.1
Mar.	6,845,777	96.6	363,334	82.0	409,659	89.6	7,618,770	95.4	1,719,813	4.4
1st qtr.	19,864,099	95.5	1,047,286	80.6	1,136,280	84.7	22,047,665	94.1	1,695,974	13.0
Apr.	5,640,273	82.2	185,140	43.2	399,074	90.1	6,224,487	80.5	1,450,929	4.2
May	6,801,633	96.0	355,659	80.3	423,350	92.6	7,580,642	94.9	1,711,206	4.4
June	6,484,114	94.5	356,907	83.2	424,228	95.8	7,265,249	94.0	1,693,531	4.2
2nd. qtr.	18,926,020	91.0	897,706	69.0	1,246,652	92.8	21,070,378	89.9	1,619,552	13.0
1st 6 mos.	38,790,119	93.3	1,944,992	74.8	2,382,932	88.8	43,118,043	92.0	1,657,749	26.0
July	6,348,611	89.8	325,080	73.6	401,826	88.1	7,075,517	88.8	1,600,796	4.4
Aug.	6,633,443	93.6	371,306	83.8	442,085	96.7	7,446,834	93.3	1,681,001	4.4
Sept.	6,594,499	96.3	387,259	90.5	443,086	100.3	7,424,844	96.2	1,734,777	4.2
3rd. qtr.	19,576,553	93.2	1,083,645	82.6	1,286,997	95.0	21,947,195	92.7	1,671,530	13.1
9 mos.	58,366,672	93.2	3,028,637	77.4	3,669,929	90.8	65,065,238	92.2	1,662,372	39.1
Oct.	7,120,753	100.5	409,657	92.5	466,485	102.0	7,996,895	100.1	1,805,168	4.4
Nov.	6,925,043	100.9	411,161	95.9	461,354	104.2	7,797,558	100.8	1,817,613	4.2
Dec.	6,927,689	98.0	393,717	89.1	459,373	100.7	7,780,779	97.7	1,760,357	4.4
4th qtr.	20,973,485	99.8	1,214,535	92.5	1,387,212	102.3	23,575,232	99.5	1,794,158	13.1
2nd 6 mos.	40,550,038	96.5	2,298,180	87.5	2,674,209	98.6	45,522,427	96.1	1,732,867	26.2
Total	79,340,157	94.9	4,243,172	81.2	5,057,141	93.7	88,640,470	94.1	1,695,495	52.2
1949										
Jan.	7,287,683	101.1	408,552	92.6	487,260	93.8	8,183,495	100.2	1,847,290	4.4
Feb.	6,633,779	102.0	379,698	95.3	467,247	99.6	7,480,724	101.4	1,870,181	4.0
Mar.	7,473,901	103.7	430,176	97.5	483,850	93.2	8,387,927	102.7	1,893,437	4.4
1st qtr.	21,395,363	102.3	1,218,426	95.2	1,438,357	95.4	24,052,146	101.5	1,870,307	12.8
Apr.	7,015,611	100.5	404,095	94.6	365,570	72.7	7,785,276	98.4	1,814,750	4.2
May	6,889,230	95.6	400,741	90.9	299,751	57.7	7,589,722	92.9	1,713,256	4.4
*June	5,954,619	85.3	349,196	81.8	194,386	38.6	6,498,201	82.2	1,514,732	4.2
*2nd qtr.	19,859,460	93.8	1,154,032	89.1	859,707	56.4	21,873,199	91.2	1,681,260	13.0
*1st 6 mos.	41,245,823	98.0	2,372,458	92.1	2,298,064	75.8	45,925,345	96.3	1,775,236	25.8
†July	5,305,239	73.8	300,236	68.2	175,302	33.8	5,780,777	70.9	1,307,868	4.4

* Revised. † Preliminary figures subject to revision.

For 1949, percentages of capacity operated are calculated on weekly capacities of 1,626,717 net tons open hearth, 99,559 net tons bessemer and 117,240 net tons electric ingots and steel for castings, total 1,843,516 net tons; based on annual capacities as of Jan. 1, 1949, as follows: Open hearth 84,817,040 net tons, bessemer 5,191,000 net tons, electric 6,112,890 net tons, total 96,120,930.

eld by the court. The company maintained the purchase of the mill as an isolated case and not subject to the state tax law.

Canadian Steel Rate Up

Although demand has slipped slightly, volume expected to be good for next three years

CANADIAN steel mills are operating at virtual capacity. Although demand slipped slightly, volume is expected to be good for the next three years.

Construction is the major factor in the dominion economy which makes unlikely a business decline even as moderate as that in the United States. Much industrial, residential and public construction was deferred earlier because of high prices. Costs now are more in line. Railroad and pipeline orders are also extensive.

The scrap situation is excellent as to price, supply and quality. Cast scrap dropped from around $50 per gross ton to $30 with limited demand. Supplies were augmented by large purchases from the U. S.

Small Mine Owners To Unite

DRIVE to save small western mines from extinction was under way in San Francisco early this month.

California mining leaders have drafted a program to be presented to the organization meeting of United Western Miners in Reno, Nevada, early in November. This group is being formed to unite some 44,000 operators of small mines who now are scattered among 71 mine organizations in the eleven western states.

L.A. Metal Plants Expand

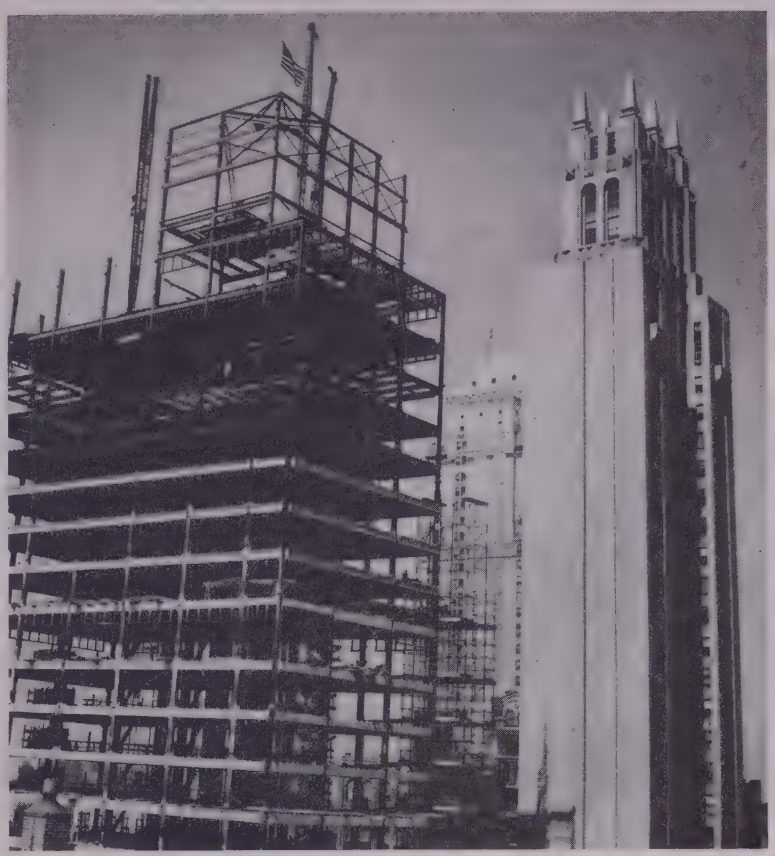
METALWORKING plants are assuming an increasingly important role in the growth of southern California industry, both in new facilities and expansions.

Report of the Los Angeles Chamber of Commerce industrial development committee ranks metal fabrication No. 1 in new plant construction. Expenditures in the first half of the year were $8,353,000. In total of new and expanded facilities, metalworking stands second only to petroleum products.

Construction Needs Shift

ALTHOUGH value of new construction to be put in place in 1949 may reach $19 billion, builders and contractors will require somewhat smaller quantities of many materials than they did for the $18.8 billion of new work done last year, Department of Commerce reveals.

Explanation lies in increases in types of construction calling for lesser quantities of some materials per dollar value of work put in place. Requirements for such materials as lumber, brick and plumbing and heating equipment will be less this year than last as a result of the drop in residential building. Amounts of cement and concrete reinforcing bars needed will be larger, as an increased volume of heavy engineering projects is being carried on.



AHEAD OF SCHEDULE: Advance planning and pinpoint co-ordination of all operations brought this skyscraper 500 feet above street level in record time. The $20 million, 36-story air-conditioned office building will be ready for occupancy four months ahead of originally scheduled date. Site is on that of the old Murray Hill Hotel, New York. George A. Fuller Co. is building it for 100 Park Avenue Inc.

Lone Star Banks Blast Furnace

LONE Star Steel Company banked its blast furnace at Daingerfield, Tex., and closed down pig iron production temporarily Aug. 8. The furnace will be down about 60 days.

A spokesman for Lone Star explained that cost studies by the company showed that capacity production and stock piling was more economical than continuous production at a reduced rate. Various grades of foundry iron and basic iron have been stocked to protect customers. When present piles are depleted, production will be be resumed. Production of coke and by-products was not affected by the shutdown.

Kaiser Lights New Coke Ovens

HENRY J. KAISER permanently closed down his shipbuilding and ship repair business in Portland, Oreg., because of lack of new business.

This move brings to an end ship operations which Kaiser built to huge proportions in the Portland area in wartime. Since September, 1947, ship repair and scrapping operations were conducted by Consolidated Builders Inc., a Kaiser-managed heavy construction firm. In the last two years 45 ships were scrapped and a number of others were converted.

Consolidated Builders now will concentrate operations on heavy construction work.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor, STEEL*

Building research program of National Research Council held as fine example of co-operation between private industry and government

TOP government research men regard the building research program just launched by the National Research Council as a fine example of co-operation between private industry and government. They hope similar setups can be inaugurated to push other research programs conceived in the public interest.

The council's new activity—to get going Sept. 1 as the "Building Research Advisory Board"—will bring together representatives of the federal government, the states, municipalities, the construction industries and educational and research institutions "to stimulate scientific and technological research in the several sectors of the building construction industry."

BRAB consists of 30 members representing the widest possible cross section of interest. Chairman is Dr. Frank B. Jewett. Full-time executive director is William H. Scheick, who resigned as co-ordinator of the Small Homes Council, University of Illinois, to take the new post.

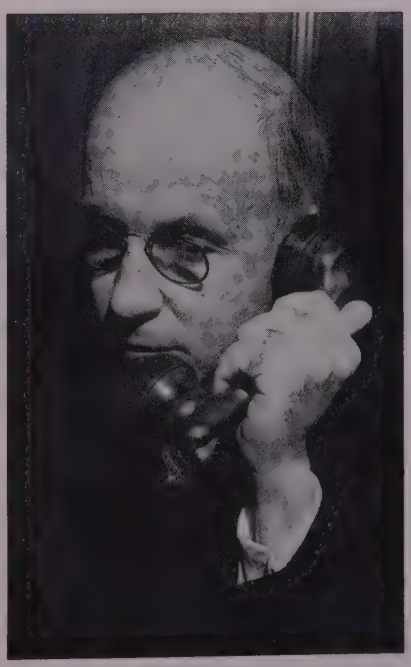
Industry Representatives — Members from industry include Dr. Charles H. Herty Jr., Bethlehem Steel Co.; G. M. Rapp, John B. Pierce Foundation, Raritan, N. J.; C. F. Rassweiler, Johns-Manville Corp., New York; H. H. Morgan, Robert W. Hunt Co., Chicago; Dr. Zay Jeffries, General Electric Co., Pittsfield, Mass.; Tyler S. Rogers, Owens-Corning Fiberglas Corp., Toledo, O.; Charles H. Tompkins, Charles H. Tompkins Co., Washington, and Wallace Waterfall, Celotex Corp., Chicago.

Government representatives are from Bureau of Standards, Forest Products Laboratory, Public Buildings Administration, National Advisory Committee for Aeronautics, and Housing and Home Finance Agency. The latter is earmarked for $3.4 million for research work in the fiscal 1950 budget. Other members represent the American Institute of Architects, American Federation of Labor, National Lumber Manufacturers' Association, several universities and research organizations, F. W. Dodge Corp., and interested trade associations.

BRAB activities will be furnished largely by private industry. Among charter contributors are Bethlehem Steel Co. and United States Steel Corp. BRAB's program is expected to cost $100,000 a year for the next five years. Money will be spent in activities to co-ordinate existing programs of research, encourage the inauguration of needed new programs and eliminate overlapping throughout the construction field in things like building design, building materials and construction methods. Prefabricated metal homes will be active on the BRAB agenda.

Outgrowth of Private Initiative— BRAB is the outgrowth of private initiative. It was set up by National Research Council at the request of the Construction Industry Advisory Council sponsored by Chamber of Commerce of the United States. CIAC is composed of representatives of some 100 professional and trade associations which have a major interest in construction. Included are the American Iron & Steel Institute, the American Institute of Steel Construction, Associated General Contractors, National Electrical Contractors, Heating Piping & Air Conditioning National Association, American Society of Civil Engineers, American Institute of Architects.

Warm commendations for his work in steering the construction industry toward this co-ordinated research organizational goal are going to F. Stuart Fitzpatrick, secretary of the Chamber's Construction Industry Advisory Council. He devoted all his time to this activity over many months.



Dr. FRANK B. JEWETT

Former Chairman of the Board of Directors of Bell Telephone Laboratories. NEA photo

No Fear of Aluminum Shortage

FEARS of an aluminum shortage in another war emergency if foreign sources of bauxite are cut off no longer are serious, thinks Dr. Robert L. Sebastian, aluminum specialist, National Security Resources Board.

He told STEEL in an informal conversation that while about 45 per cent of our raw material now is foreign bauxite, we have huge quantities of lower-grade material at home and "we have the processes for using them." All that is necessary is to provide some plant facilities required for complete self-sufficiency.

Large potential reserves are the plentiful laterite ores of Oregon and Washington. To use them on a large scale would require the erection of plant facilities and development of more electric power in the Northwest. Low-grade ore, Dr. Sebastian points out, already is used on a large scale in production at the Hurricane Creek plant in Arkansas—and the reserves of such ore in that district are large. Three of four experimental plants built during World War II produced alumina from clay, so processes developed in these plants are available for use if necessary. He also told STEEL that large deposits of bauxite are available by short ocean hauls from Jamaica, Haiti and other Caribbean islands.

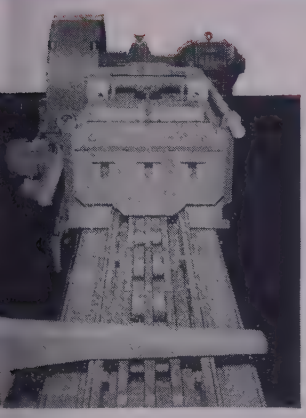
Monopoly Legislation Delayed

ALTHOUGH the monopoly subcommittee of the House Judiciary Committee does not intend to write new legislation until after further hearings to be held in the fall, indications now are that the group is impressed with the need for drastic action to prevent further growth of monopoly. This is shown in a summary by Rep. Emanuel Celler (Dem., N. Y.), chairman of both the committee and the subcommittee, of the information garnered during the trial-run hearings in the period July 11—Aug. 5.

"Most witnesses have warned that if corporations are allowed to continue to grow, the government will either have to step in and regulate them or take them over in the pub-

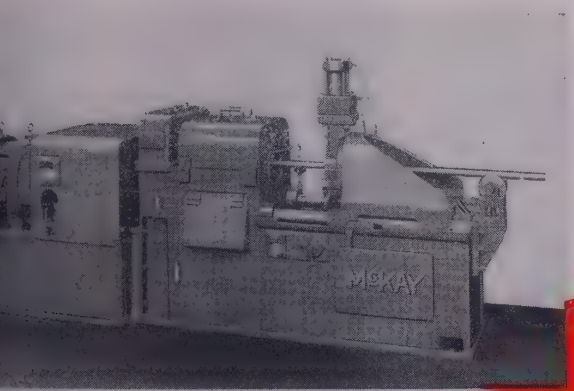
McKAY

BAR DRAWING EQUIPMENT



BAR DRAW BENCHES

ydraulic push pointers are optional.
itomatic wedge type grip-buggy for single and multiple aw with quick change feature.
ydraulic or pneumatic throw-off arm.
-speed automatic grip-return with slow pull-in feature.
eel construction throughout.
onstant or variable speed drive.
ilt for single or multiple draw.



ROTARY BAR POINTER

control of tool speeds
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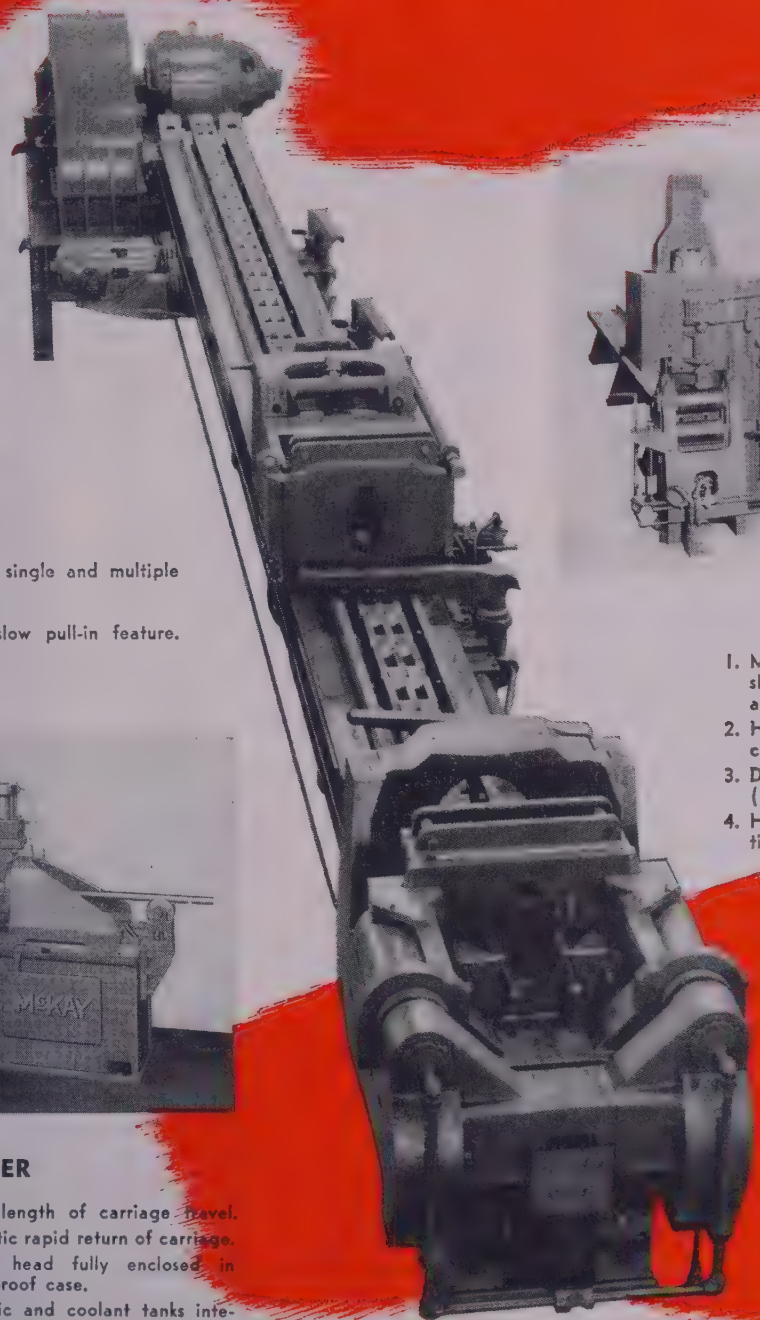
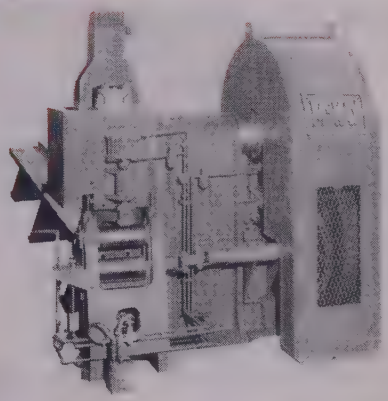
riation of feed control.
y operated grips.
grip and feed (work is
ripped before feed be-

5. Pre-set length of carriage travel.
6. Automatic rapid return of carriage.
7. Cutting head fully enclosed in splash proof case.
8. Hydraulic and coolant tanks integral with base. Sight gages indicate fluid level.





BAR SHEAR

1. McKay open throat bar shear features the air operated pinch rolls (optional).
2. Hold-down gag for square cutting.
3. Dumping type gauge table (optional).
4. Heavy mill type construction throughout.

The McKAY MACHINE Company
ENGINEERS AND MANUFACTURERS OF TUBE AND BAR DRAWBENCHES AND BAR SHEARS
YOUNGSTOWN, OHIO

lic interest. Several witnesses have pointed out how uncontrolled monopoly in other nations of the world has led to fascism, communism, or some form of democratic socialism."

Suggestions the subcommittee will study, Mr. Celler says, range all the way from amending the antitrust laws to rewriting them completely, and from stopping the formation and growth of new monopolies to breaking up existing ones. The committee hopes to be ready with legislation early next year to permit action in the 1950 session of Congress. One of the moves contemplated at this time is repeal of laws that permit a "lessening of competition"—as the Miller-Tydings act, Robinson-Patman act, Webb-Pomerene act, Maloney act and the Reed-Bulwinkle act.

Pending resumption of the hearings in October, the committee staff has been instructed to write reports on ground covered to date; one of these reports is to deal with monopolies or lessening of competition resulting from acts of big labor unions.

Big Engineering Projects Seen

ENGINEERING projects of unprecedented magnitude several years from now are foreseen as a result of a survey by the Bureau of Reclamation to estimate potential sources and quantities of surplus water in the Far West. Here's the problem: Vast fertile areas in the Southwest cannot be used because of lack of water. Some may be abandoned because of dangerous lowering of the ground water level by excessive pumping as in Arizona. The Columbia and other rivers in the Northwest, however, are wasting huge quantities of water to sea. What the bureau has in mind is the possibility of transferring excess water of the Northwest to the parched areas to the South. The program is one of preparation for the future needs of our expanding population.

Scrap Industry Hopeful

SCRAP industry hopes it will get a decision prior to yearend on its request for substantially lower freight rates on ferrous scrap. The matter was discussed with representatives of southern railroads at Atlanta Aug. 8. Other conferences with regional railroad groups will be held at St. Louis Aug. 16, again at Atlanta Sept. 13, at New York Sept. 14, and at Chicago or Omaha, Nebr., Sept. 15.

The industry, represented by the Institute of Scrap Iron and Steel Inc., seeks a 25 per cent reduction in the rates that prevailed prior to the action of the Interstate Commerce Commission some months ago in granting interim increases on the railroads' request to increase freight rates generally by 13 per cent. At the time the ICC granted interim increases of 6 per cent in the East, 5 per cent in the South and 4 per cent in the West. ICC still is considering final action in the case.

Bill To Prevent Loss of Copper

A PRIMARY purpose of the administration-fostered mining bill, S. 2105, now before the Senate Committee on Interior and Insular Affairs, is to prevent loss of copper in extremely deep mines in northern Michigan. These closed down as a result of the recent sharp decline in the market price of the metal. To prevent flooding of the mines, Interior Department under this bill would buy their output for the national stockpile at a price that may be as much as 25 per cent above the market price of copper. The secretary of Interior would have powers to pay similar premiums for any other strategic or critical minerals whose loss was threatened by sagging market prices. The bill also would encourage strategic and critical minerals exploration by payments to small miners, covering up to 50 per cent of their costs.

New Uses for Radioisotopes

TWO new industrial uses of radioisotopes have been made in the last year, the Atomic Energy Commission reports. One is in connection with a study of friction with radioactive piston rings and the other involves a new method of studying the flow of oil through pipe lines.

"With radioactive piston rings," the commission reports, "it is possible to trace engine wear with great accuracy and in a short period of time while the engine is running continuously. The radioactive particles worn off the rings drop into the lubricating oil. Radioactivity measurements on the oil in turn indicate the amount of wear which has taken place.

"The pipe line study involves using a radioactive tracer to follow the flow of a boundary between two different types of crude oil."

Lobbyists Report Spendings

LOBBYISTS spent a record $4,098,653 in the first half of 1949. Reports filed with Congress indicate the total was $635.338 more than the total reported for the same six months last year. Number of organizations reporting were 261; last year 218 reported. Among six groups reporting more than $100,000 in expenditures is the National Small Business Men's Association of Akron with $129,637.

Monopoly Legislation Held Up

REPEAL of wartime imposed excise taxes, review of excise levies predating the war and a "modest increase" in individual income tax exemptions has been called for by the National Planning Association. The association's recommendations came as Rep. Robert L. Doughton (Dem., N. C.), chairman of the House Ways and Means Committee, threw a wet blanket on prospects for repeal of excise taxes this session. NPA asked for immediate repeal of all excise taxes imposed during the war "for the purpose of restricting consumption and lessening pressure of inflation." About $1 billion in excise taxes were paid on such items as toilet preparations, photographic equipment, light bulbs, etc. in 1948.

President Truman, too, says that nothing can be done about repealing the wartime taxes before next session of Congress. He told a news conference that a lot of research by congressional committees is required.

Beardsley Ruml, former chairman of the Federal Reserve Bank of New York, says that excise rates should and could be repealed this month. He says rates "are producing an ever widening black depression in affected industries."

Census Book in Second Printing

HEAVY popular demand necessitated a second printing of the 363-page "Historical Statistics of the United States." Published by the Census Bureau this year, the book contains 3000 time series, arranged in statistical tables, measuring the growth and development of the United States. Three hundred tables date back to 1789, and the series on colonial population starts with 1610. Orders for buckram-bound copies may be placed at $2.50 with the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The book is a supplement to the Statistical Abstract of the United States.

"Development and Selling New Products," is the title of a new Commerce Department booklet available from the Superintendent of Documents at 25 cents. Commerce's Office of Domestic Commerce is promoting it as "geared to the manufacturer who wants to round out lines, find new lines, keep machinery in full-time operation, provide continuous work for his employees."

European Industrial Activity Inching Up

Mild surge in demand for metalworking products gives temporary relief to United Kingdom, France and Belgium. Explanations are varied

EUROPEAN industrial activity is inching upward despite the financial jitters and diplomatic headaches brought by revelation of Britain's continuing dollar shortage.

Giving at least temporary relief to the United Kingdom, France and Belgium is a mild surge in demand for metalworking products. Explanations for the rise are:

1. Britain's economic position, although not good, is nevertheless clear. Many purchasers of British goods were holding up orders pending decision on the revaluation of the pound.

2. Intra-European currency and credit exchange regulations have been agreed upon. Although the stipulations are disappointingly rigid to many, the decision clears up ambiguities which were hampering trade for months.

3. European sales efforts, particularly with industrial fairs, are beginning to pay off.

4. Prices are falling slightly as a result of new manufacturing efficiencies and competition.

5. Scattered instances of recovery in the U. S. are psychologically beneficial to the European economy.

6. Unilateral trade agreements, particularly the British-Argentine pact, are spurring commerce, temporarily at least.

7. Material shortages with attendant production disruptions are practically over.

United Kingdom

BRITAIN's steel rerollers, mostly in the Midland area, are operating at full capacity, the first time since the war that this has been possible for any extended period. These plants traditionally have relied on Continental semifinished steel, only now available in sufficient quantity.

In the first half of this year 179,200 net tons of semifinished was imported, compared with 63,840,000 tons in the first six months of 1948. Pig iron imports also jumped, 180,856 tons during the first half of 1949, compared with 22,400 in the same half last year.

Britain's steel exports continue to gain: 1,296,091 tons were shipped overseas in this first half, compared with 1,050,177 in the first six months of 1948. Most went to commonwealth nations and colonies in the first half of this year.

Foundries are still operating at near capacity levels, although backlogs are diminishing. Capital goods makers are maintaining their high rates. Aircraft producers are booming: more than $36,270,000 worth of aircraft were exported to at least 20 countries in the first quarter of this year. This indicates an annual total well above the 1948 figure of $100,750,000. No falling off in freight car output is anticipated this year. Demand for electric generating equipment holds.

Sales efforts at the British Industries Fair in May are seen as one reason for the good showing in these lines. Manufacturers of small, mass-produced articles like minor home appliances found the going rough at the fair, a condition which correctly foretold their current reduced operating schedules.

TURNTABLE: Part of a Lorain power shovel being loaded into a Norwegian freighter on its first trip into the Great Lakes. Shovel will be used in war-damaged areas of Norway

Belgium

BELGIUM AND Luxemburg exported 2,364,012 net tons of steel products in the first half of this year compared with 1,764,655 in the first six months of 1948. Principal recipients were Britain, the Netherlands, Sweden, Norway, Italy and Greece. Sales to the U. S. have dropped steadily, totaling only about 1200 tons in June.

Belgian prices for exports to Switzerland have been shaded to meet competition from Italy, Czechoslovakia, Poland and Germany. For the free markets, prices fluctuate with the circumstances of each case. Merchant bars are quoted at $93.20 to $95.45 per metric ton f.o.b. Antwerp.

No definite conclusion has been reached in regard to the formation of a Belgo-Luxemburg cartel to control export prices and quotas. Opposition has risen from three Belgian basic producers and also from all the rerollers.

France

FRENCH unilateral commercial agreement with Norway provides that 110,000 net tons of French steel products will be shipped to the Scandinavian nation within a period of 12 months.

This and other trade agreements should tide over France's steel industry which is finding domestic demand more sluggish. Aggregate output of steel for France and the Saar in June was slightly below the sched-

uled production. It was 1,002,100 tons against the target of 1,076,000. The average monthly rate thus far this year, however, is slightly above this target level.

The severe drought has brought further electric power cuts. Electricity of France, the national organization supplying power and light, is modifying its program of dam construction because water flow in some rivers has proved too uncertain. Fewer dams will be built, but more power plants constructed on rivers where the water flow is steady. Most of the French steam power plants erected since 1945 have American equipment.

The Queuille cabinet has withstood another crisis, although by only three votes. The issue was a special vacation bonus to social security employees which the government had granted. Agitation arose to grant the bonus to all workers, particularly farm laborers who aren't under the social security system.

Italy

PROGRESS reports to ECA indicate that a large share of the equipment to modernize five Italian iron and steel plants under the Marshall Plan will go to American builders. For the contemplated improvements (see STEEL, July 18, p. 64, for details) ECA has authorized $9,111,235, while Italian funds in the amount of 4,660,500,000 lira will be spent. American firms earmarked to get one or more orders each for iron and steel works equipment and machinery to produce such finished products as bolts and nuts are:

Hydropress Inc., New York; National Machinery Co., Tiffin, O.; Pittsburgh Coal Washer Co., Ambridge, Pa.; H. A. Brassert & Co., New York; Wah Chang Trading Corp., New York; Lewis Foundry & Machine Co., Pittsburgh; E. W. Bliss Co., Detroit; United Engineering & Foundry Co., Pittsburgh; Mesta Machine Co., Pittsburgh; Cold Metal Process Co., Youngstown; Aetna Standard Co., Youngstown; Wean Engineering Co., Warren, O.; Federal Machine & Welder Co., Warren; Welding Equipment & Supply Co., Detroit; Pittsburgh Lectromelt Furnace Co., Pittsburgh; Swindell-Dressler Corp., Pittsburgh; Salem Engineering Co., Salem, O.; Yoder Co., Cleveland; Morgan Construction Co., Worcester, Mass.; Westinghouse Electric Corp., East Pittsburgh, Pa.; Holden Co., New Haven, Conn.; Clark Equipment Co., Buchanan, Mich.; National Acme Co., Cleveland; Hagan Corp., Pittsburgh; Leeds & Northrup Co., Philadelphia.

Decline Alters Pattern

Ingots and semifinished steel turned down steadily after February

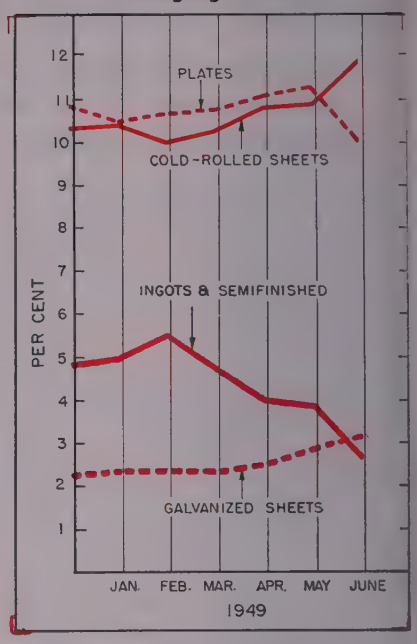
DECLINE in demand for steel is altering the pattern of product distribution, a review of American Iron & Steel Institute's statistics shows.

Ingots and semifinished steel, which during the steel supply stringency was in heavy demand for conversion purposes and constituted more than 5 per cent of all steel products distributed, turned downward after hitting 5.6 per cent in February. In June it had slumped to 2.7 per cent. Percentages in intervening months were: March, 4.9; April, 4.0; and May, 3.9. This trend along with changes in three other products are portrayed in the accompanying line chart. June product distribution is shown in the accompanying table.

Effect of sustained demand from the automotive industry for steel while overall demand eased is seen in an increase in proportion of tonnage going into cold-rolled sheets, a chief item to automakers. Since February when 10 per cent of all steel products distributed were cold-rolled sheets, there has been an uptrend in percentage: March, 10.3; April, 10.8; May, 10.9; and June, 11.9.

Drop in railroad freight car building began to make itself felt in the June distribution of plates, following a May percentage that was higher than that of any preceding month in 1949 or any month in 1948. The

Changing Pattern



Adjustment in the pattern of steel product distribution this year to fit the changed requirements of metalworking industries is portrayed here from figures compiled by the American Iron & Steel Institute

Steel Product Shipments, June And Year To Date

Steel Products	Number of companies	Items	JUNE - 1949			To Date This Year		
			Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)	Net Shipments (Excluding Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale) (Net Tons)	Per cent of Total Shipments	Shipments to Members of the Industry for Conversion into Further Finished Products or For Resale (Net Tons)
Ingots, blooms, slabs, billets, tube rounds, sheet and tin bars, etc.	47	1	139,148	2.7	146,267	1,486,524	4.4	1,375,977
Skelp	6	2	16,396	0.3	32,343	55,154	0.2	240,433
Wire rods	21	3	46,334	0.9	13,047	306,282	0.9	132,352
Structural shapes (heavy)	11	4	327,230	6.3	3,758	2,190,856	6.5	17,121
Steel piling	3	5	37,404	0.7	32	181,336	0.5	1,357
Plates	20	6	516,709	10.0	14,332	3,624,346	10.8	127,222
Rails—Standard (over 60 lbs.)	4	7	203,085	3.9	1,625	1,090,248	3.3	6,299
Rails—All other	2	8	7,650	0.2	25	79,298	0.2	1,203
Joint bars	7	9	10,844	0.2	2,508	68,057	0.2	21,154
Tie plates	6	10	37,442	0.7	-	245,792	0.7	41
Track spikes	8	11	11,053	0.2	-	66,126	0.2	35
Wheels (rolled or forged)	2	12	30,090	0.6	101	179,437	0.5	598
Axles	2	13	15,050	0.3	12	114,064	0.4	29
Hot rolled bars (including light shapes)	39	14	564,172	10.9	58,060	3,956,088	11.8	416,221
Hot rolled bars—Reinforcing	24	15	141,292	2.7	23	834,101	2.5	2,264
Cold finished bars	33	16	103,290	2.0	408	778,969	2.3	4,282
Tool steel bars	17	17	4,233	0.1	35	33,651	0.1	449
Pipe—Standard	17	18	200,080	3.9	3,975	1,187,693	3.5	28,682
Pipe—Line	12	19	203,414	3.9	707	1,191,006	3.6	10,612
Pipe—Oil country goods	14	20	136,741	2.7	8,105	804,391	2.4	48,323
Tubes—Boiler	3	21	11,276	0.2	752	65,651	0.2	5,500
Tubes—Mechanical and pressure	21	22	53,674	1.0	1,420	402,891	1.2	10,694
Miscellaneous pipe (including conduit)	12	23	17,466	0.3	17	140,152	0.4	972
Wire—Drawn	38	24	168,182	3.3	8,203	1,188,442	3.5	73,899
Wire—Nails and staples	17	25	67,904	1.3	298	445,594	1.3	5,317
Wire—Barbed and twisted	15	26	22,222	0.4	-	138,116	0.4	32
Wire—Woven wire fence	13	27	37,667	0.7	-	231,923	0.7	1,480
Wire—Bale ties	11	28	4,570	0.1	-	27,208	0.1	-
Black plate	10	29	29,762	0.6	-	298,292	0.9	254
Tin and terne plate—Hot dipped	10	30	180,271	3.5	-	900,349	2.7	10
Tin plate—Electrolytic	10	31	206,549	4.0	-	1,005,172	3.0	42
Sheets—Hot rolled	28	32	525,024	10.1	58,283	3,628,603	10.8	372,688
Sheets—Cold rolled	26	33	616,922	11.9	1,121	3,596,748	10.7	11,725
Sheets—Galvanized	15	34	158,401	3.1	27	877,485	2.6	418
Sheets—Long terne	2	35	14,090	0.3	152	80,589	0.2	505
Sheets—Enameling	7	36	12,106	0.2	378	105,293	0.3	1,631
Sheets—Electrical	11	37	28,214	0.6	-	221,214	0.7	-
Strip—Hot rolled	23	38	149,642	2.9	23,331	916,318	2.7	158,153
Strip—Cold rolled	34	39	120,524	2.3	2,318	882,977	2.6	12,574
All other	4	40	1,193	-	-	7,232	-	-
Total steel products	138	41	5,177,259	100.0	381,661	33,633,668	100.0	3,090,548

May figure was 11.3 and June's was 10.0.

Continued strong pressure for galvanized sheets as demand eased for some other products has resulted in channeling of an additional percentage of steel into galvanized sheet. In January, February and March the percentage was static, 2.4. An upturn pushed the figure to 2.6 in April, 2.9 in May, and 3.1 in June. The June percentage is greater than that of any preceding month in 1949 or any month of 1948.

Standard rails also have shown an important upturn percentagewise since February; hot-rolled bars have been on the downgrade since April.

Containers Take More Steel

DISTRIBUTION of finished steel to four market classifications rose in May although total tonnage distributed by mills fell below that of April.

American Iron & Steel Institute reports these four groups and their May tonnages from mills compared with April receipts are: Containers, 363,095 net tons in May, 353,956 in April; export, 372,694 in May, 320,300 in April; mining, quarrying and lumbering, 32,962 in May, 32,834 in April; and ordnance and other military, 8972 in May, 7886 in April. However, total finished steel shipped from mills in May declined to 5,234,862 net tons from 5,596,786 in April.

Although jobbers, dealers and distributors received less tonnage from mills in May than in April their percentage of total mill shipments rose from 17.2 per cent in April to 17.9 per cent in May. Their May receipts were 939,902 tons, compared with 964,021 in April.

The automotive industry continuing in May as the No. 1 consumer of steel received 933,723 net tons, compared with 993,336 tons in April. Construction, including maintenance, remained in second place by taking 658,308 tons in May, compared with 708,508 in April. The container industry moved up from fourth place consumer to third and rail transportation slipped from third to fourth.

Bottleneck in Home Financing

SLOW-MOVING home financing machinery is responsible for stalling distribution of prefabricated homes. That is what Carl G. Stranlund, president of Lustron Corp., Columbus, O., told a congressional committee. Two high Reconstruction Finance Corporation officials joined him in telling the House Committee on Banking & Currency that the Federal Housing Administration fails to meet needs of distributors of prefabricated homes.

Richard C. Dyas, RFC housing loan chief, also told the committee that distributing these homes from the factory delivery platform to ultimate consumers was now the major bottleneck in mass-production of homes.

Need for financing distribution rather than continued financing of prefabricator's productive equipment was stated clearly as the occasion for increasing RFC's $50 million loan ceiling to $100 million.

Coast Firm Builds Mexican Ships

MEXICAN contract for five welded steel shrimp trawlers costing $250,000 has been received by National Steel & Shipbuilding Corp., San Diego, Calif.

Vessels will be 54 feet long, with a cruising range of 2000 miles, and are being built for Pesquera Topolobompo, S.A., one of Mexico's leading fishing firms.

Tuna Packing Mechanized

MECHANIZATION that will cut labor costs one-third is underway in southern California's tuna packing industry. Automatic packing machines are being installed in two of San Diego's largest tuna canneries, and similar equipment has been ordered by other plants.

Tuna packing machines already are used successfully by the Columbia River Packers Association, Astoria, Oreg. In addition to cutting labor costs, machines reduce waste.

Westinghouse Reduces Radios

PRICE CUTS of from 16 to 41 per cent on 16 radio models have been made by Westinghouse Electric Corp., Pittsburgh. The reductions range from $5 to $200.

Industrial Relations Clinic Slated

WALLACE BENNETT, president of the National Association of Manufacturers; H. J. Heinz, president of H. J. Heinz Co. and chairman of United States Council of International Chamber of Commerce; and Lawrence Appley, president of the American Management Association, will be among the eight speakers appearing before the fall industrial relations clinic of the Associated Industries, organization of employers in the Cleveland area.

More than 1000 representatives of management from Ohio and its neighboring states are expected to attend these meetings to be held at the Hotel Carter, Sept. 15-16.

CALENDAR OF MEETINGS

Aug. 15-17, Society of Automotive Engineers: National West Coast meeting, Portland, Oreg.

Aug. 23-26, American Institute of Electrical Engineeers: Pacific general meeting, Fairmount Hotel, San Francisco. Headquarters are at 33 W. 39th St., New York 18.

Sept. 9-12, Instrument Society of America: Clinic on maintenance of industrial instruments, Hotel Statler, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 12-16, Instrument Society of America: National conference and exhibit, Municipal Auditorium, St. Louis. Society headquarters are at 921 Ridge Ave., Pittsburgh.

Sept. 14-16, Porcelain Enamel Institute: 11th annual forum, Ohio State University, Columbus, O. Institute headquarters are at 1010 Vermont Ave. N.W., Washington.

Sept. 21-24, National Association of Foremen: 26th convention, Hotel Statler and Masonic Temple, Detroit. Association headquarters are at 321 W. First St., Dayton, O.

Sept. 25-Oct. 1, American Institute of Mining & Metallurgical Engineers: Midyear meeting, Neil House, Columbus, O. Details may be obtained from J. H. Melvin, Orton Hall, Ohio State University, Columbus, O.

Sept. 26-28, National Electronics Conference: 1949 conference and exhibit sponsored by Illinois Institute of Technology, Edgewater Beach Hotel, Chicago. Nathan Cohn, Room 1505, 307 N. Michigan Ave., Chicago, heads the exhibit committee.

Sept. 29, American Iron & Steel Institute: Regional technical meeting, Hotel Statler, Buffalo.

Oct. 3-4, National Association of Corrosion Engineers: South central regional meeting Adolphus Hotel, Dallas. Heading the arrangement committee is G. R. Olson, United Gas Pipe Line Co., Shreveport, La.

Oct. 3-5, American Coke & Coal Chemicals Institute: Annual meeting, Skytop Lodge, Skytop, Pa. Institute headquarters are at 129 15th St., Washington.

Oct. 3-6, Association of Iron & Steel Engineers: Annual convention, William Penn Hotel, Pittsburgh. Association headquarters are at 1010 Empire Bldg., Pittsburgh.

Oct. 4-6, Society of Industrial Packaging & Materials Handling Engineers: Fourth annual exposition, Detroit.

Oct. 6, American Iron & Steel Institute: Regional technical meeting, Drake Hotel, Chicago.

Oct. 10-14, American Society for Testing Materials: First Pacific area national meeting, Fairmount Hotel, San Francisco. National headquarters are at 1916 Race St., Philadelphia.

Oct. 12-15, Electrochemical Society: 96th convention, La Salle Hotel, Chicago. Details may be obtained from H. B. Linford, secretary of the society.

Oct. 13-15, Industrial Management Conference of the University of Missouri: Third annual meeting, University of Missouri, Columbia, Mo.

Oct. 14-15, American Institute of Mining & Metallurgical Engineers: Annual fall meeting, Southern Ohio Section of Open Hearth Committee, Deshler-Wallick Hotel, Columbus, O. Institute headquarters are at 29 W. 39th St., New York.

Oct. 14-16, Metal Treating Institute: 17th annual meeting, Cleveland.

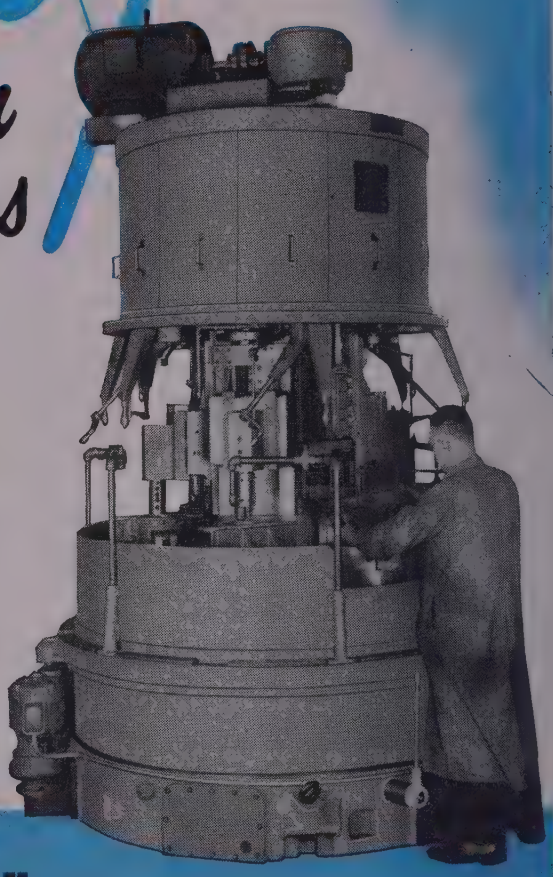
Oct. 16-18, Conveyor Equipment Manufacturers Association: Annual meeting; write to G. D. O'Brien, assistant manager, Greenbrier Hotel, White Sulphur Springs, W. Va.

Oct. 17-21, 31st Annual National Metal Congress and Exposition: Sponsoring societies are: **American Society for Metals, American Welding Society, Metals Branch of the American Institute of Mining and Metallurgical Engineers and Society for Nondestructive Testing.** Public Auditorium, Cleveland. Secretary of American Society for Metals is W. H. Eisenman whose headquarters are at 7301 Euclid Ave., Cleveland 3.

Accuracy plus economy on odd shaped pieces

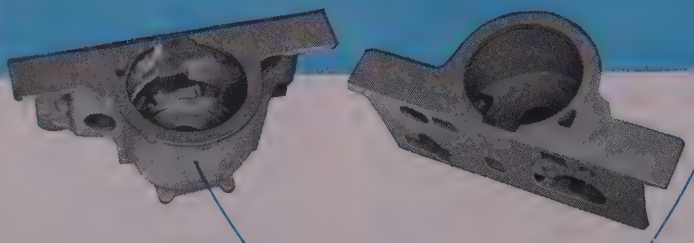
. . on the Type "D" . .

BULLARD MULT-AU-MATIC



REPETITIVE ACCURACY

of Mult-Au-Matics is well known throughout the Automotive and other fields, where these machines have proven their ability to lower manufacturing costs. Here this sixteen inch six spindle, Type "D" Mult-Au-Matic is shown at work on an odd shaped piece. This is no problem, since work is chucked in a lying down position rather than hanging it up. Many other features of Mult-Au-Matics save time and lower manufacturing costs. Write for estimates on your work as applied to these machines. **The Bullard Company, Bridgeport 2, Conn.**



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***All in all . . .* Use Bullards for manufacturing Economies.**

By A. H. ALLEN *Detroit Editor, STEEL*

Mirrors of Motordom

Ford strike poll largest ever conducted under Michigan's "Little Taft-Hartley Act," costs taxpayers $20,000. Gives union a little more pressure to use in contract negotiations

DETROIT

LARGEST strike poll ever to be conducted under state auspices was that held last week among 77,000 Ford employees throughout Michigan, costing taxpayers a neat $20,000. The voting was held under provisions of the state's Bonine-Tripp or "Little Taft-Hartley Act," and a special session of the legislature had to be called to authorize funds for holding the event which took on many of the aspects of a circus. Some 34 voting booths were lined up across from headquarters of Local 600 of the UAW-CIO, despite protests from the company which had offered to provide facilities on its own property. The union appropriated $12,000 to charter a fleet of busses to transport employees from the plant to the polling places and to provide free sandwiches for all. Meanwhile a sound truck kept the sweltering lines amused with assorted melodies and repeated urgings to vote in favor of strike action.

There was little question of a majority supporting strike action, mainly because few union members care to act contrary to instructions from their leaders. The only doubt was the size of the plurality. Union sources were confidently predicting 10 to 1 support, less-biased forecasters suggested 3 to 1 or 4 to 1, depending upon the size of the total vote. First indications were that perhaps 90 per cent of the 60,000 Rouge plant workers would cast ballots, all on their own time. Announcement of the final tabulation was expected late in the week from state labor mediation board offices.

Company Stands Firm—The result does not necessarily mean a strike, since all it does is to give union negotiators a little more pressure which they can bring to bear in contract talks with company representatives. It will mean little, since the company is remaining firm in rejecting pension and wage increase demands and in adhering to its offer to extend the present contract and wage rates for 18 months, with the provision wage discussions may be reopened next July 15. For its part the UAW has been pulling out all the stops to stir up employee resentment against the company, at times resorting to flagrant untruths.

This significant observation has been made by the company—"If we are forced into a strike because of union leaders' insistence on unreasonable demands, we are of the opinion that it will last a long time." Doubtless it was aimed particularly at the wives and families of employees who stand to be the principal sufferers from another period of unemployment such as they have already experienced earlier this year.

Seek To Establish Pattern—The eyes of the entire country are focused intently on the current difficulties at Ford. The UAW-CIO is trying desperately to establish another wage-increase pattern which then can be forced down the throats of other sections of the automotive industry now in process of negotiating over wages, as well as thousands of suppliers' plants. It might even be that if a suitable pattern could be wrung out of Ford it could be picked by the CIO steelworkers and bludgeoned into effect throughout the steel industry. The earliest date at which a Ford strike could be authorized is Aug. 18 although it is not likely to develop that soon. Walter Reuther of the UAW will want to bring his negotiations to more of a fever pitch before making the dramatic gesture which would tie up Ford again. Perhaps he will prefer to hold off until the steel industry "fact-finding" panel has made its report and time his action in concert with Phil Murray's boys.

Wood-on-Steel Construction

CHRYSLER'S 1949 Town and Country convertible coupe, of wood-on-steel construction, is being introduced this month. The entire underbody now is made of steel, with wood used basically for decorative rather than structural purposes. Floor sills, pillars, rear quarter inside panels, dash and cowl panel, as well as inside door panels all are steel. Body paneling is fashioned to resemble mahogany grained wood by means of a special photographic transfer process on the metal, this "Di-Noc" paneling being used on doors, rear quarter sections, deck lid and lower deck panel. White ash wood trim is fitted over the steel underbody on doors, rear quarter panels, deck lid and lower deck panel and then securely bolted to the steel supporting members.

All underbody parts are joined by arc or spot welding, reinforced at strategic places with steel plates and braces. Floor sills are of heavy-gage steel, formed into a box section and then reinforced by heavy Z-section plate. Rear quarter panels, quarter pillars and lock pillars are braced rigidly to the floor sills and wheel housings to give the rear body structure greater resistance to torsional movement. A steel belt bar is welded to the quarter pillars, wheel house panels and shelf panel so that it ties in the quarter panels from side to side, minimizing some of the rattles which develop in convertibles because of the lack of any steel roof bracing.

Buick Special Prices Up

PRICES on the new Buick special, disclosed last Tuesday, were not as low as some of the advance guesses had placed them but were still something to give concern to competitors like Mercury, Hudson, Packard, Nash and Chrysler. List prices on the three body types were $1695, $1745 and $1795. This makes "advertised delivered prices" in Detroit, not including sales taxes or extras, $1819, $1872 and $1925. Heater and radio would add another $150 and the dynaflow transmission another $150, making it difficult to get a fully equipped model into the owner's garage for much under $2100. Checking the

Automobile Production

Passenger Cars and Trucks—U. S. and Canada

	1949	1948
January	445,092	422,236
February	443,734	399,471
March	543,711	519,154
April	569,728	462,323
May	508,101	359,996
June	623,689	454,401
Six mos.	3,134,055	2,617,581
July	605,000*	489,736
August		478,186
September		437,181
October		516,814
November		495,488
December		514,337
12 mos.		5,549,323

*Preliminary.

Estimate for week ended:

	1949	(Same week) 1948
July 23	160,123	118,797
July 30	138,727	113,270
Aug. 6	144,707	108,864
Aug. 13	147,000	112,342

Estimates by Ward's Automotive Reports

delivered prices against those quoted for the special last December reveals an increase of $65 on the four-door and $85 on the two-door.

Builds Trucks for Israel

FORD has announced it will start immediate production on approximately $4 million worth of trucks and busses ordered by the government of Israel, covering 1800 vehicles. Purchase agreement specifies that an immediate payment of 40 per cent of the total will be made in dollars from funds Israel receives from the Export-Import Bank, and the company will extend credit on the 60 per cent balance, which will be paid in equal annual installments over a three-year period. This is a considerable departure from the company's usual policy on sales to foreign governments.

Engines and other component parts will be manufactured at the Rouge Plant, assembled at Edgewater, N. J., and loaded at Atlantic Coast ports as quickly as shipping space can be obtained.

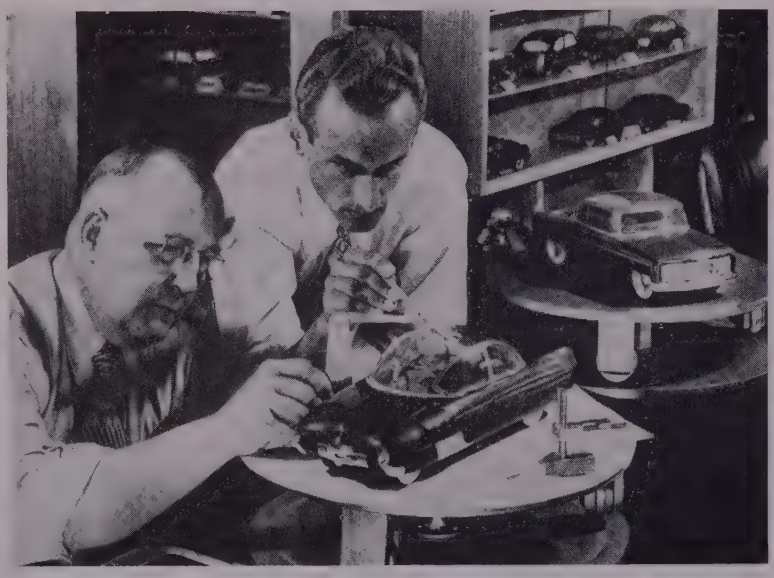
Action Against Willys Dismissed

DISMISSAL of action against Willys-Overland Motors, Empire Securities Inc. and Willys Real Estate Realization Corp., alleging excessive payments in 1946 by Willys-Overland Motors for purchase of stock of Wilson Foundry & Machine Co., Pontiac, Mich., and 16 buildings at the Toledo plant, from the Real Estate Corporation, has been ordered by the state court in chancery at Wilmington, Del. Evidence presented by the companies showed the foundry and buildings were bought for about $6 million in cash and stock and have been in constant use since that time. The purchase figure was less than one other offer for the foundry stock—made by Continental Motors—and less than an appraisal and audit of the plant buildings in Toledo.

Studebaker Previews

STUDEBAKER Corp. in first seven months of 1949, has repeatedly broken all previous daily, weekly and monthly production records. In the same period its dealers delivered more cars and trucks at retail than in any full year before 1947. This information was divulged by H. S. Vance, chairman and president of the corporation, at a private press preview of the company's 1950 passenger car models at the Palmer House, Chicago, Aug. 8.

The 1950 Studebaker models will be shown publicly later this month. It will be recalled that the postwar Studebaker featured advanced styling, and according to Paul Davis, general sales manager, the 1950 job is a surprising refinement of this basic styling. Indications are that prices on the new models will be about the same as on present models. After first of the year an automatic transmission will be available at extra cost. This transmission will be probably a Borg-Warner product, of the torque-converter type, engineered especially for the new Studebaker.



NO CHILD'S PLAY: Judges of the Fisher Body Craftsman's Guild competition recheck the height on one of the many car models sent in by boys from all over the nation. NEA photo

Tucker Operation Costly

ENGINEERING surveys of the Tucker Corp. operation in Chicago have been made public, indicating it would cost better than $71 million to put the company in condition to produce cars on a commercial scale, would require 17-18 months for completion and would involve numerous design changes in the proposed Tucker vehicle. Management engineering firm of Stevenson, Jordan & Harrison made the estimates and submitted reports to trustees in reorganization under bankruptcy proceedings.

The analysis stated it would require $21,653,283 for pre-production expense and $49,553,000 of working capital to organize production of 300 cars a day, or 60,000 yearly, estimated the first car could not be produced until the ninth month after a start, and would have to carry a list price of $3289.

Engineers also said Tucker's transmission, involving a torque converter at each wheel, was not practical because of excessive power loss, while his later idea of an electric control plus hydraulic booster is not what would be desired in the final design. They added that the proposed wheel suspension needed considerably more research, and body panels would have to be redesigned because they were too costly and difficult to produce. A few other troubles were noted, such as tendency of the car to wander at high speeds, too costly frame and bumpers, poorly arranged muffler and exhaust pipe, and too expensive center headlight. They admitted the disk-type brakes and 24-volt electrical system were "feasible if properly adapted."

Accurate Measuring Device

A SUPERSENSITIVE instrument known as a contact modulated amplifier, which can measure the cooling rate of steel during quenching to determine hardenability, and also can determine minute changes in the blood's oxygen content, was described at a New Hampshire research conference recently by Joseph F. Lash of General Motors Research Laboratories. Essentially what the device does is to measure direct-current signals as faint as a few hundredths of a microvolt and at the same time is not as sensitive to vibrations as a galvanometer. The amplifier can be handled virtually like a portable radio.

You will be amazed at the performance of the REDESIGNED *Cleveland* END MILLS

STRONGER! CUT FASTER! CLEAR CHIPS BETTER!

Much Greater Durability and Accuracy!

The new *Cleveland* End Mills are far superior to any you have ever used! They have been completely redesigned to give you strength, speed and accuracy that were never before obtainable! Many months ago we set out to design a different and better end mill. Neither time nor effort was spared in patient development work. We even worked out a new technique for testing the cutting qualities and the stamina of end mills. Users are enthusiastic about the results: Less breakage, many more cuts per grind, consistent accuracy . . . with up to *50% increase in feed.* For high speed, low cost operation, use the new *Cleveland* End Mills on your next job. Contact our Stockroom nearest you, or . . .

Telephone your Industrial Supply Distributor

STRONGER

No sharp corners or points where localization of stresses might occur. Minimum amount of metal has been cut away.

MORE DURABLE

New-style clearance supports the cutting edge; assures against "flaking" or "chipping out."

LONGER LIFE

Radically new flute shape and chip clearing ability reduce wear on the cutting edge, thus maintaining consistent accuracy.

CUT FASTER

New flute shape gives maximum cutting qualities at increased rates of feed.

CLEAR CHIPS BETTER

Redesigned flutes are machine polished. There are no pockets. Chips are free to move.

GREATER ACCURACY

New clearance and accurate machine polish of flutes result in closer control of size.

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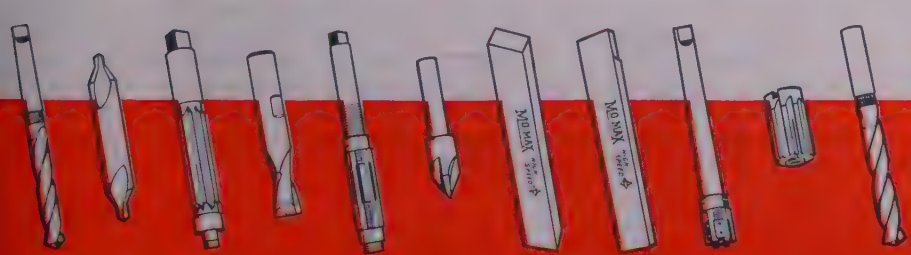
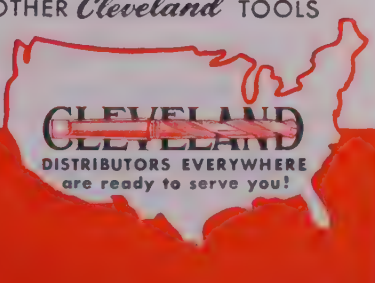
1242 East 49th Street • Cleveland 14, Ohio

Stockrooms: New York 7 • Detroit 2 • Chicago 6 • Dallas 1 • San Francisco 5 • Los Angeles 11

E. P. Barrus, Ltd., London W. 3, England

ASK YOUR INDUSTRIAL SUPPLY DISTRIBUTOR FOR THESE AND OTHER *Cleveland* TOOLS





Revere Coast Plant

In full operaion, fabricating copper and copper alloy rod and tube

RECENTLY-OPENED Pacific Coast Division of Revere Copper & Brass Inc. is in full operation fabricating copper and copper alloy rod and tube for customers in 11 western states. Designed to be a self-sustaining part of the West Coast economy, it draws on the Pacific Northwest refineries for virgin copper and purchases spelter from zinc-producing western states.

Plant, first fabricating unit for copper and copper alloys to be built privately on the Pacific Coast, is an "L" shaped building 700 ft by 130 ft. It was built by Bechtel Corp., Los Angeles. General offices of Pacific Coast Division are attached to the plant. Charles J. Paumier is works manager.

Special facilities have been installed for handling of copper and brass scrap from local manufacturers. Among production facilities for fabricating finished products is an Ajax electric furnace that will make alloy mixtures on the spot.

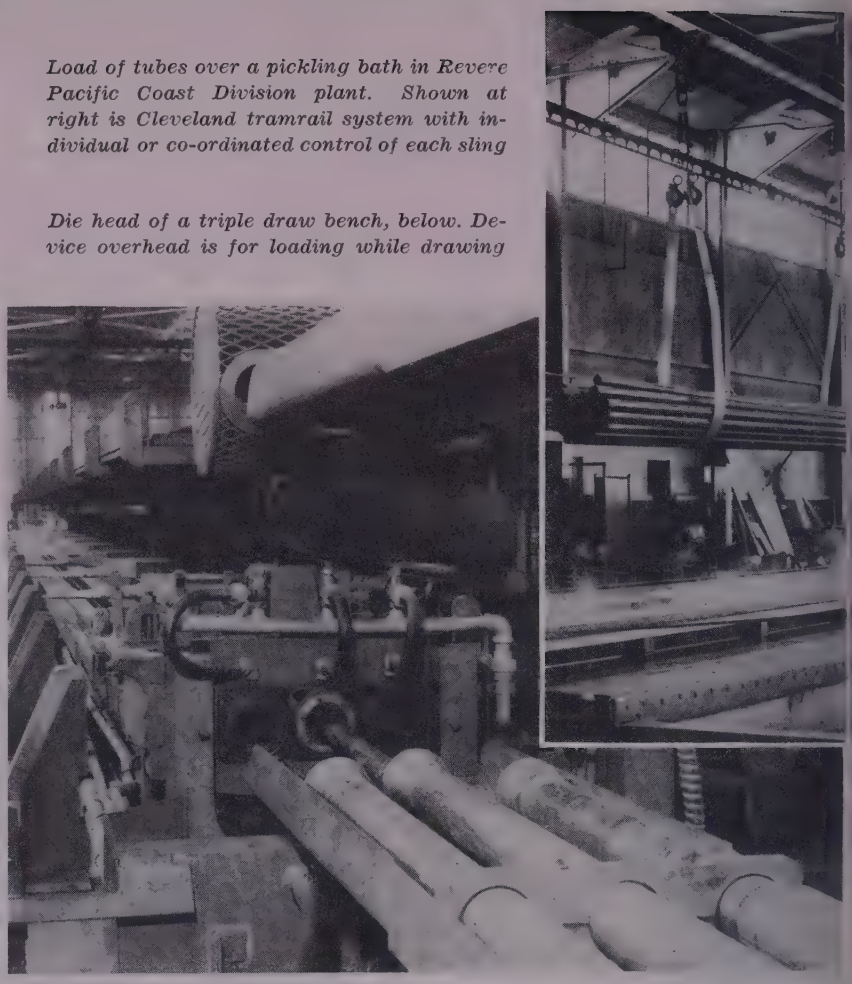
Equipment includes a heavy tonnage hydraulic piercing press for providing rod and tube shells. It was designed by Schloemann Engineering Co. Heating and annealing furnaces were built by Dempsey Industrial Furnace Co. and Electric Furnace Co. They are adapted for either natural gas or propane. Boilers were supplied by the Steamaster Automatic Boiler Co., Los Angeles.

Auxiliary equipment includes a crane system utilizing Cleveland tramrail units that tie all parts of the plant together; pointers by the Langelier Mfg. Co., Torrington Co. and Frederick M. Conran Machine Co.; saws by Espen-Lucas Machine Works; conveying equipment by Mathews Conveyor Co. and Lampson Corp.; and industrial trucks by Clark Equipment Co. and Towmotor Corp.

Revere expects to complete expansion work on aluminum facilities in its tube plant at Canton, O., this month. Primarily a strip rolling mill, the Canton plant previously had turned out extruded shapes and forgings. Improvements will cost the company about $1.5 million.

Load of tubes over a pickling bath in Revere Pacific Coast Division plant. Shown at right is Cleveland tramrail system with individual or co-ordinated control of each sling

Die head of a triple draw bench, below. Device overhead is for loading while drawing



To Install 2 Huge Generators

WESTINGHOUSE ELECTRIC Corp., Pittsburgh, will install two of the largest steam generators ever built by the company at the new Elrama Power Station of Duquesne Light Co., Pittsburgh. Each generator will weigh more than 1 million pounds and will be 14 ft high and 90 ft long. To be completed by early 1952 and big enough to supply all electrical needs of a city as large as Atlanta, generators will consume 1 million pounds of steam per hour and use 2000 gallons of water each minute.

Abrasive Prices Streamlined

STREAMLINING of Michigan Abrasive Co.'s abrasive prices has been brought about by a single discount to make cost figuring and resale prices easier. The Detroit company has stopped pricing by the chain discount method used widely in the abrasive industry.

Winter Furnace Line Completed

COMPLETION of manufacturing and marketing plans for full production of an expanded line of home heating equipment has been made by American Furnace & Foundry Co., Milan, Mich.

New line consists of more than 30 different sizes and models of oil, gas and coal furnaces and winter air conditioners. All models have been either redesigned or improved.

Reconstruction Completed

RECONSTRUCTION of the former 10-acre Remington-Rand plant in Johnson City, N. Y., has been completed by the Wigton-Abbott Corp., for the General Electric company. Work on the one-story structure included general redesign and remodeling, installation of high temperature rooms, renovation of the electrical system and construction of a network of roadways.

Machinery Manufacture Renewed

E. W. BLISS Co. is renewing manufacture of Bliss semiautomatic container-making machinery. It will be designed, manufactured and serviced from Bliss' Hastings, Mich., plant. Equipment to be offered includes Bliss gang slitters, power formers, lock seamers, flangers, beaders, double seamers — round and rectangular, air and water testers, thread rollers and five-gallon can equipment. Bliss had been forced to curtail operations in the can-making machinery field in the past year.

Briefs . . . .

Paragraphs on developments of interest and significance within the metalworking industry

American Type Founders, Elizabeth, N. J., will be exclusive distributors of type designs of Typefoundry Amsterdam Ltd., Amsterdam, Netherlands. Type will be cast on ATF bodies in the Netherlands.

—o—

American Swiss Co., Toledo, O., has sold its automobile stamping and lock business to Standard Products Co., Cleveland.

—o—

Strong, Carlisle & Hammond Co., Cleveland machinery builder, has purchased a 2-story brick building from Burke Machine Tool Co., Cleveland, for its subsidiary, Strong Steam Specialty Co., Corry, Pa.

—o—

Tamms Silica Co., Chicago, has changed its name to Tamms Industries Inc.

—o—

Ziegler Steel Service Co., sheet and strip specialist of Los Angeles, has opened its Oakland Division at 2307 Union St., Oakland Calif.

—o—

Ferracute Machine Co., Bridgeton, N. J., has appointed C. R. Terry of Terry Machinery Co., Cleveland, as agent.

—o—

Rockwell Mfg. Co.'s new Power Tool Division has made its headquarters in Milwaukee. Division will serve as selling organization for four other Rockwell divisions manufacturing various types of power tools: Arcade Mfg. Division, Freeport, Ill.; Red Star Products Co., Norwalk, O.; Crescent Machine Division, Leetonia, O., and Rockwell Delta Mfg. Division, Milwaukee.

—o—

Milwaukee Chaplet & Mfg. Co., Milwaukee, has been appointed Wisconsin distributor for Bay State Abrasive Products Co., Westboro, Mass.

—o—

Burrell Corp. is the new name of Burrell Technical Supply Co., Pittsburg. Burrell handles laboratory furnaces, testers and instruments.

—o—

First American power apparatus to be installed in Pakistan will be four 5000-kw hydroelectric generators furnished by Westinghouse Electric International Co. Generators are for a power station to be built at Dargai in the northwest frontier province of Pakistan.

—o—

Penn Metal Co. Inc., New York, manufacturer of expanded metal lath, channel iron, corner bead and rib lath, has opened sales offices at 8629 Thackeray St., Dallas. A. A. Goodson Jr. is district sales representative. Penn Metal now in 80th year of business is expanding its plant at Parkersburg, W. Va.

—o—

Sunstrand Machine Tool Co., Rockford, Ill., has acquired Rockford Magnetic Products Co. and will operate it as a subsidiary under the name Sundstrand Magnetic Products Co. The subsidiary's line of products includes: Standard chucks for grinders, shapers, milling machines and lathes, lifting magnets, hand separators and special holding magnets.

—o—

Stanworth Mfg. Co., Lebanon, Ind., maker of high speed cutting tools, has been purchased by Fred. G. Phillips and Walter Susemichel, both of Engineering Metal Products Corp., Indianapolis, and J. Edward Marston, same city.

—o—

Whitman & Barnes Division, United Drill & Tool Corp. has moved to 40600 Plymouth Rd., Plymouth, Mich. The new plant increases the company's work area to more than 250,000 sq ft.

—o—

Westinghouse plants from Chicago to Atlanta and from Boston to St. Louis—13 in all—were given the National Safety Council's Distinguished Service to Safety Award. The 42,000 employees in these plants compiled a record of more than 90 million man-hours of work with less than three lost-time accidents per million man-hours.

—o—

Ozalid Division of General Aniline & Film Corp. has moved to a modern office and warehouse in Los Angeles, 1001 N. Brea. New facilities allow for display of Ozalid printmaking machines and dry-process reproduction materials.

—o—

L. O. Koven & Brother Inc., manufacturer of boilers, tanks, etc., has added a metal spraying shop to its plant facilities in Jersey City, N. J.

—o—

Stoody Co., Whittier, Calif., has added two new distributors for its line of hard facing alloys: Morris, Wheeler & Co., Philadelphia, for eastern Pennsylvania, New Jersey, Delaware and Maryland; and Silver Welding Supply Co., Boston, for the eastern half of Massachusetts. Stoody has published a revised edition of the "Stoody Guidebook" covering applications of hard facing alloys in heavy industry.

—o—

Pittsburgh Lectrodryer Corp., manufacturer of dehumidification equipment, has appointed two new sales agents: Kerr Machinery Co., Detroit, for the Detroit area and G. Baillie Houliston, Cincinnati for southern Ohio.

—o—

Atlas Imperial Diesel Engine Co., Oakland, Calif., has acquired Lorimer Diesel Engine Co., Oakland, and will take over manufacture and distribution of Lorimer engines.

—o—

Permanente Metals Corp.'s sales in the current fiscal year, ending next May 31, will be about 20 per cent larger than in the last fiscal year, says Henry J. Kaiser, president. Consolidated net sales totaled $61,593,000 the past fiscal year.

—o—

Brown Instruments Division of Minneapolis-Honeywell Regulator Co. is scheduling one 13-week and two five-week courses to help customers to obtain maximum benefits from their process control equipment. Courses run from Aug. 15 to Dec. 2.

—o—

Vacuum Cleaner Manufacturers' Association reports factory sales of standard size household vacuum cleaners in June totaled 207,354 units compared with 222,850 in May—6.9 per cent less, and a decrease of 19 per cent from June, 1948. Sales in the first half of 1949 totaled 1,463,100 vacuum cleaners, or 87.6 per cent of sales in all of 1941, highest prewar sales year.

—o—

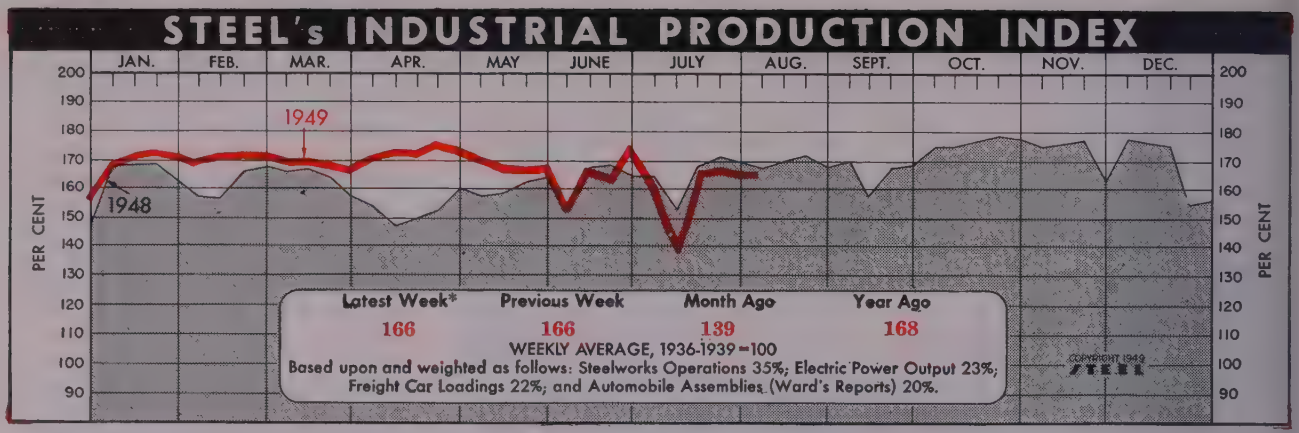
Southern States Iron Roofing Co., Savannah, Ga., will open two new branches to be located in Atlanta and Louisville. Two more branches will be opened within the next three months. Atlanta and Louisville branches will manufacture aluminum and steel roofing and fixtures.

—o—

Fafnir Bearing Co., New Britain, Conn., has awarded its annual Elisha H. Cooper Memorial Scholarship for 1949 to Richard E. Vahlstrom, whose father has been a company accountant for 26 years. Scholarship is valued at $1000 a year and is good for four years of study at Yale.

—o—

Reynolds Metals Co., Richmond, Va., will open offices Sept. 1 at 661 Geary St., San Francisco. Reynolds manufactures lead, zinc, aluminum and composition foil for many industries.


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
PER CENT
1949
1948
Latest Week* Previous Week Month Ago Year Ago
166 166 139 168
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
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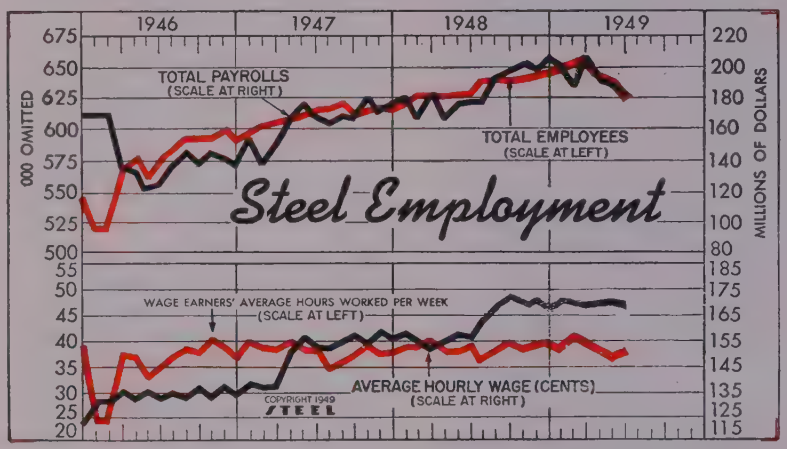
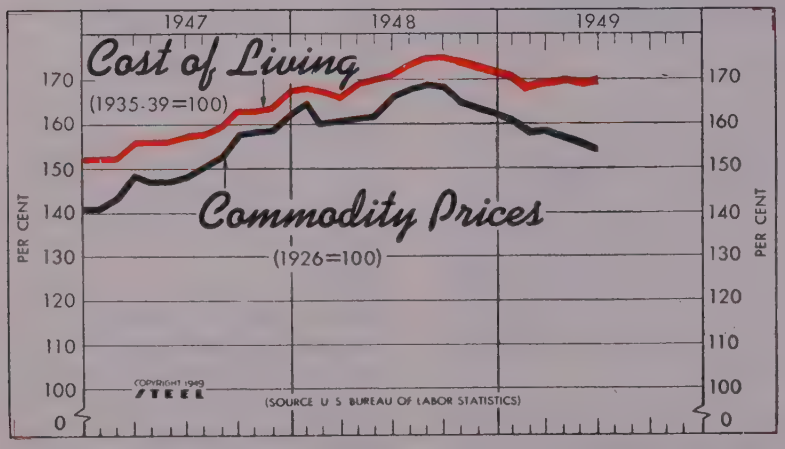
Week ended Aug. 6 (preliminary).


1946 1947 1948 1949
000 OMITTED
MILLIONS OF DOLLARS
TOTAL PAYROLLS (SCALE AT RIGHT)
TOTAL EMPLOYEES (SCALE AT LEFT)
Steel Employment
WAGE EARNERS' AVERAGE HOURS WORKED PER WEEK (SCALE AT LEFT)
AVERAGE HOURLY WAGE (CENTS) (SCALE AT RIGHT)
COPYRIGHT 1949 STEEL

Steel Employment

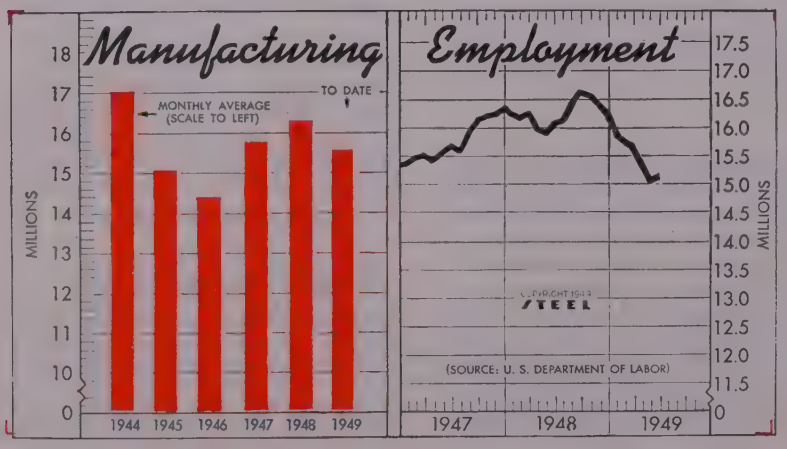
	Employees† (000)		Total Payrolls (millions)		Hourly Wages† (cents)	
	1949	1948	1949	1948	1949	1948
Jan.	650	622	$202.1	$180.2	171.3	157.3
Feb.	653	626	189.8	167.6	169.6	155.1
Mar.	652	629	207.2	183.0	168.5	154.8
Apr.	647	626	191.9	168.5	168.8	155.1
May	637	628	188.4	175.3	169.7	157.7
June	625	634	181.8	179.5	168.4	156.9
July	....	641	....	179.8	....	164.5
Aug.	....	645	....	193.8	....	168.9
Sept.	....	641	....	199.4	....	171.8
Oct.	....	644	....	201.7	....	169.9
Nov.	....	646	....	199.8	....	172.1
Dec.	....	648	....	205.8	....	169.4

† Monthly average.



Wholesale Commodity Price—Cost of Living Indexes

	Commodities (1926=100)			Living Cost (1935-39=100)		
	1949	1948	1947	1949	1948	1947
Jan.	160.6	165.7	141.5	170.9	168.8	153.3
Feb.	158.1	160.8	144.5	169.0	167.5	153.2
Mar.	158.4	161.4	149.5	169.5	166.9	156.3
Apr.	156.9	162.7	147.7	169.7	169.3	156.2
May	155.7	164.2	147.1	169.2	170.5	156.0
June	154.4	166.4	148.0	169.6	171.7	157.1
July	....	168.7	150.8	....	173.7	158.4
Aug.	....	169.5	153.7	....	174.5	160.3
Sept.	....	168.7	157.4	....	174.5	163.8
Oct.	....	165.2	158.5	....	173.6	163.8
Nov.	....	164.0	159.6	....	172.2	164.9
Dec.	....	162.3	163.2	....	171.4	167.0
Ave.	....	164.9	151.8	....	171.2	159.2



Factory Employment

	(000 omitted) 1949	1948	1947
January	15,890	16,267	15,372
February	15,756	16,183	15,475
March	15,625	16,269	15,510
April	15,332	15,950	15,429
May	15,030	15,904	15,569
June	15,061	16,115	15,672
July	.....	16,158	15,580
August	.....	16,441	15,962
September	.....	16,683	16,175
October	.....	16,576	16,209
November	.....	16,455	16,256
December	.....	16,284	16,354
Monthly Ave.	.....	16,274	15,794

The Business Trend

ACTIVITY in the metalworking industry has settled on at least a temporary plateau with STEEL's industrial production index for the week ended Aug. 6 at a preliminary 166 per cent of the 1936-1939 average, unchanged from the preceding week. In the last five weeks there has been only one slight deviation from this level. A glance at the accompanying chart shows current operations to be below those for the same period last year and prospects for a climb to the level attained in the last half of 1948 appear slim.

STEEL—The ingot rate advanced half a point over the preceding week in the week ended Aug. 6 but was 12.5 points below the corresponding week last year. Operations are expected to show a modest gain in the current week.

AUTOMOBILES—Although passenger car and truck assemblies in the week ended Aug. 6 were up about 6000 units over the preceding week, 144,707 compared with 138,727, the pace was behind projected schedules. Canadian operations were at reduced levels because of vacations in Big Three plants and several U. S. plants were handicapped by intense heat. Some idea of the production performance of the industry can be gained from the fact that during the current week the 3 millionth U. S. built passenger car for 1949 came rolling off an assembly line.

CONSTRUCTION—Civil engineering construction had a big week in the five-day period ended Aug. 4. Contract volume during the week totaled $239,245,000 to set a record for the year and post the second best weekly total in the postwar period. The total was 81 per cent above the volume for the preceding week and 56 per cent above the same week last year.

TRANSPORTATION—American Trucking Associations Inc. reports the volume of freight transported by motor carriers in June increased 6.6 per cent over May and 0.5 per cent over June, 1948. The carriers transported an aggregate of 3,013,691 tons in June, compared with 2,826,934 in May and 2,997,286 tons in June of last year. Carriers of iron and steel hauled about 4 per cent of the total tonnage. Their traffic volume increased 15.9 per cent over May and 39.3 per cent over June, 1948.

POWER—Sales of electric energy to customers totaled about 19.9 billion kwhr in May, compared with about 19.2 billion in May of last year. Revenues from customers were $368.6 million in May, a 7.8 per cent gain over the $341.9 million in May, 1948.

COAL—Bituminous coal stockpiles climbed to a postwar high of about 74.2 million tons on July 1, up 1.9 per cent over a month earlier. Industrial stocks on that date totaled about 71.3 million tons, averaging 66 days supply.

SALES—Commerce Department reports that manufacturers' sales in June totaled $16.5 billion or $200 million above May. Inventory book values declined $500 million to $30.4 billion during the month. The June increase in sales appeared larger after seasonal adjustments since there is normally a drop in sales from May to June.

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	81.5	81.0	60.0	94.0
	Electric Power Distributed (million kilowatt hours)	5,466	5,518	4,982	5,319
	Bituminous Coal Production (daily av.—1000 tons)	1,225	1,162	227	2,093
	Petroleum Production (daily av.—1000 bbl)	4,670	4,677	4,668	5,505
	Construction Volume (ENR—Unit $1,000,000)	$239.2	$131.8	$138.5	$153.6
	Automobile and Truck Output (Ward's—number units)	144,707	138,727	118,611	108,864
	* Dates on request. † 1949 weekly capacity is 1,843,516 net tons. 1948 weekly capacity was 1,802,476 net tons.				
TRADE	Freight Car Loadings (Unit—1000 cars)	709†	724	595	879
	Business Failures (Dun & Bradstreet, number)	171	168	153	116
	Money in Circulation (in millions of dollars)‡	$27,419	$27,333	$27,659	$27,922
	Department Store Sales (changes from like wk. a yr. ago)‡	−11%	−10%	−10%	+7%
	† Preliminary. ‡ Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$12,599	$12,701	$12,535	$13,278
	Federal Gross Debt (billions)	$254.2	$253.2	$252.5	$253.4
	Bond Volume, NYSE (millions)	$17.1	$13.1	$9.9	$14.4
	Stocks Sales, NYSE (thousands of shares)	5,280	4,617	3,573	3,863
	Loans and Investments (billions)†	$63.5	$63.3	$62.6	$63.1
	United States Gov't. Obligations Held (millions)†	$35,590	$35,507	$34,178	$34,870
	† Member banks, Federal Reserve System.				
PRICES	STEEL's Composite Finished Steel Price Average	$91.82	$91.82	$91.82	$93.55
	STEEL's Nonferrous Metal Composite‡	179.1	178.3	168.0	216.9
	All Commodities†	152.6	152.8	152.7	169.3
	Metals and Metal Products†	167.9	167.9	165.6	169.8
	† Bureau of Labor Statistics Index, 1926 = 100. ‡ 1936-1939 = 100.				

Men of Industry

CHARLES E. STUTENROTH

Charles E. Stutenroth has been appointed manager of the Fabricating Division, Armco Steel Corp., Middletown, O., succeeding **J. R. Freeze** who asked to be relieved of his responsibilities because of ill health. Mr. Freeze will continue with Armco as consultant on fabricating problems. Mr. Stutenroth, who joined the company in 1927, has held a number of executive positions in the Fabricating Division with his latest position being assistant manager of the division.

—o—

L. B. Dobbins has been appointed supervisor of plant engineering, Air Reduction Sales Co., New York. He will administer plant engineering matters not assigned to general engineering supervision and will act as liaison between Airco's operating and research and engineering departments on problems of a technical and engineering nature. Mr. Dobbins will be succeeded as superintendent of the Johnstown, Pa., tonnage oxygen plant by **J. C. White,** former superintendent of the Gloucester, N. J., plant.

—o—

Carl D. Smith has joined R. G. LeTourneau Inc., Peoria, Ill., as special representative of the sales division. He had been associated with Firestone Tire & Ruber Co. for many years, working on development and use of large rubber tires on high speed earthmoving and construction equipment.

o

Gilbert W. Chapman has been elected president of Yale & Towne Mfg. Co., New York. He succeeds **Calvert Carey** who resigned because of poor health. Mr. Chapman became vice president in charge of finance for Yale & Towne in June, 1948, after serving as president of American Water Works Co.

—o—

J. H. Reitz, formerly assistant manager of Republic Steel Corp.'s northern coal mine district, has been appointed manager of the district following resignation of **James L. Hamilton.** In his new capacity he will be in charge of coal mining operations at ten Republic mines in western Pennsylvania, West Virginia and Kentucky, with headquarters in Uniontown, Pa.

—o—

Allis-Chalmers Mfg. Co., Milwaukee, announces appointment of **C. Stuart Haagensen** as assistant manager of the labor relations department and secretary of the negotiating committee. Mr. Haagensen has served in the firm's labor relations division since 1939. In the same department **Herbert J. Rass** has been named employment manager for the company's West Allis Works. In the commercial research department, **J. F. Fitzsimmons** has been named manager succeeding **J. R. Reed** who has resigned to establish his own business.

—o—

Henry R. Hansen has been appointed sales representative in Colorado, Montana, Wyoming, Utah, New Mexico and part of Nebraska by Bliss & Laughlin Inc., Harvey, Ill. He succeeds the late **W. C. Judy.** Formerly employed by M. L. Foss Inc., Mr. Hansen will make his headquarters in Denver.

—o—

Randall R. Burden will head the Truck Body Division, Artisan Metal Works Co., Cleveland. As sales director for the new division Mr. Burden

RANDALL R. BURDEN

JAMES T. FOX

will be in charge of engineering and development work for the activity and will be responsible for getting it into production by Sept. 1. In his years of experience in the truck field are included more than 11 years of association with Artisan.

—o—

James T. Fox, acting manager of the Missouri-Illinois plant of Koppers Co. Inc., Granite City, Ill., has been named manager. He succeeds **Myron T. Herreid,** newly elected vice president and general manager of the company's Gas & Coke Division. Mr. Fox joined Koppers in 1941 as superintendent of blast furnaces at the Granite City plant and in 1948 was made works manager. Before joining Koppers, he worked for Delta Chemical & Iron Co. and Interlake Iron Corp. Other appointments in the division include: **Harold F. Ebken,** former procurement manager for the Missouri-Illinois plant, has been named personnel manager for the division; **M. W. Gaylord,** formerly plant engineer for the division's St. Paul plant, has been appointed production manager; and **J. E. Spears,** division control manager, will continue in his present capacity.

—o—

Election of **Herman D. Carus** as president and treasurer has been announced by Matthiessen & Hegeler Zinc Co., La Salle, Ill.

—o—

Hugo T. Wilder has been made manager of the marketing division of Aluminum Co. of America's sales department. He has been with Alcoa since 1919 when he joined the company's New York sales office. In 1944 Mr. Wilder was made manager for the company's pig and ingot sales

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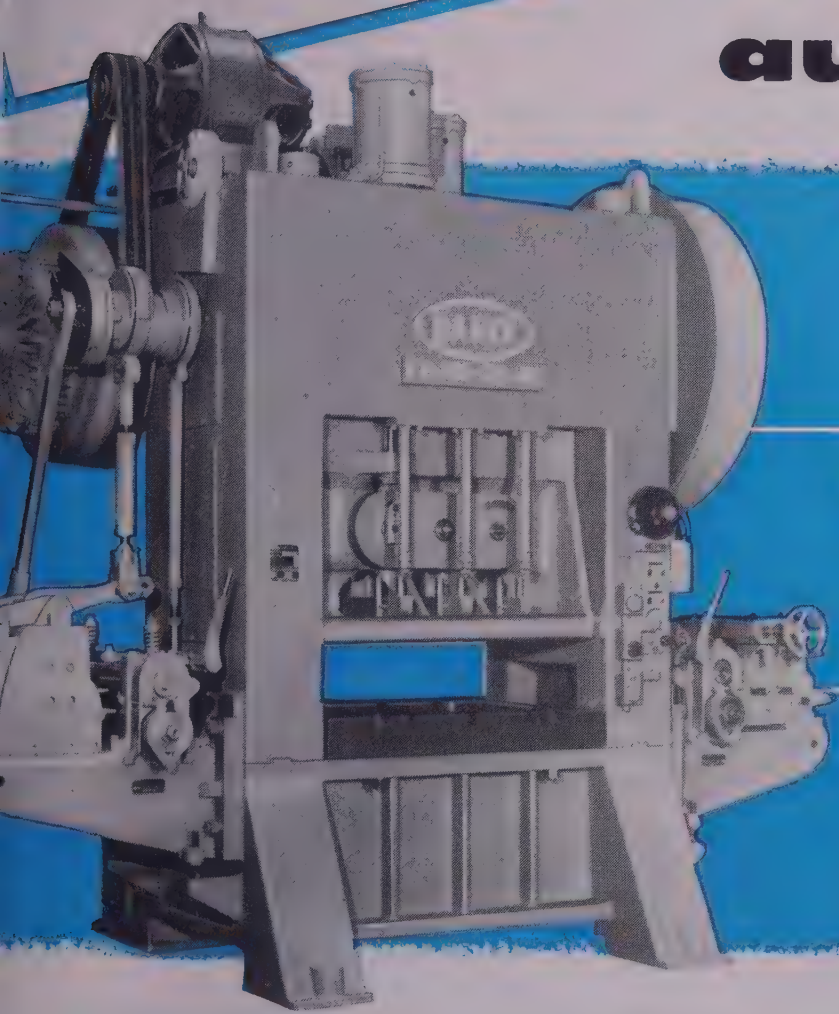

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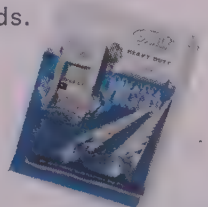

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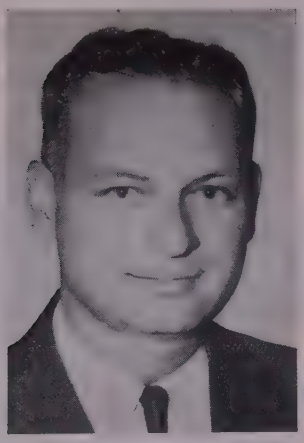

NORMAN M. STED

and in 1946 assumed additional duties of warehouse manager. In his present position Mr. Wilder will continue to work out of the firm's main office in Pittsburgh.

—o—

Promotions in the sales department of American Steel & Wire Co., Cleveland, U. S. Steel Corp., subsidiary, are: **Norman M. Sted** to the post of manager of the manufacturers products sales division at the company's headquarters, **Maxwell D. V. Millard** to manager of the Detroit district sales office and **Edward A. Murray** to manager of the Chicago district sales office. Other appointments and titles of the new positions held are: **Robert M. Page,** manager, Worcester, Mass., sales, succeeding **F. Kenneth Sawyer,** retired; **Paul Ketring,** director of cold-rolled strip sales; **Harry F. McAnerney,** assistant manager, manufacturers products sales; **James R. Mohr,** assistant manager, Detroit district sales; **Fred L. Nonenmacher,** manager of manufacturers products sales in Chicago; and **Frank T. Clarke,** manager of manufacturers products sales in New York.

—o—

Chemicals Division, Marathon Corp., Rothschild, Wis., announces appointment of **Frank C. Morman** to head advertising and sales promotional activities for the division.

—o—

Announcement of four major appointments in Highand Park, Mich., operations has been made by Ford Motor Co., Dearborn, Mich. **Edgar F. Wait** has been named assistant plant manager; **C. F. Hancock,** resident controller; **Clifford E. Bernard,** general superintendent, trim, paint and artificial leather manufacturing; and **Clarence W. Brown,** manager of works standards. Mr. Wait, formerly with Firestone Tire & Rubber Co., came to Ford in 1936 to organize and build a tire plant. He remained in charge of tire manufacturing until 1942, when the government purchased the plant. He then became a general superintendent and in 1945 was appointed director of manufacturing services.

—o—

Appointment of **Paul Chandler** as assistant engineer of tests is announced by Lukens Steel Co., Coatesville, Pa. Mr. Chandler joined Lukens in 1947 as an industrial engineer after association in a similar capacity at Homestead Works of Carnegie-Illinois Steel Corp. in Munhall, Pa.

—o—

Howard Davies has been assigned to the Syracuse, N. Y., district sales office by Warner & Swasey Co., Cleveland. Mr. Davies joined the firm in 1927 and has been connected with the sales engineering department since 1939.

—o—

H. L. Bradbury has been appointed to the newly created position of manager of railway sales for Elastic Stop Nut Corp. of America, Union, N. J. He joined the firm's production department in 1941 after more than 15 years' association with U. S. Leather Co. and was transferred to the sales staff in 1943.

—o—

Ceilcote Co., Cleveland, announces appointment of **W. A. Severance** as chief chemist in charge of research and development, product control and special customer problems in the field of corrosion proofing. Mr. Severance was formerly with Parker Appliance Co.

—o—

John Kenney has been promoted to public relations manager of the Chicago works, International Harvester Co., Chicago. His position as public relations manager of the Milwaukee works will be filled by **Roger Marxsen.**

—o—

William Van C. Brandt, formerly manager of railway and motive power sales for Electric Storage Battery Co., Philadelphia, has assumed the post of managing director of Electric Industrial Truck Association, Long Island City, N. Y. He succeeds **C. F. Kells** who left EITA to join a publishing firm. **M. W. Heinritz,** vice president of Gould Storage Battery Corp., Trenton, N. J., succeeds Mr. Brandt as vice president of EITA.

—o—

Stuart D. Goulding has been named to head the newly established department of public relations at Youngstown Sheet & Tube Co., Youngstown. Mr. Goulding was formerly associated with Rheem Mfg. Co., New York, as public relations manager.

—o—

Matthew J. Delehaunty has been named district sales manager for the Pittsburgh branch, United States Rubber Co., New York. He succeeds **J. W. Greenwalt** who has retired. A veteran of 27 years of service with the company, Mr. Delehaunty will direct Pittsburgh district sales of products manufactured by the company's Mechanical Goods Division.

—o—

Appointment of **Edward Hurlburt** as manager of consumer advertising and **Walter E. Schutz** as manager of industrial advertising has been announced by Power Tool Division, Rockwell Mfg. Co., Pittsburgh. Appointment of **Fran Hopp** as assistant manager of industrial advertising was announced at the same time. All will make their headquarters in Milwaukee.

—o—

R. E. Williams, director of production planning, Columbia Steel Co., U. S. Steel Corp. subsidiary, San Francisco, has been appointed assistant to the vice president in charge of sales. **R. O. Hails** succeeds him as director of production planning. Mr. Williams joined the sales department of Columbia Steel in 1935 and became director of production planning in 1944. Mr. Hails joined the company in 1937 in sales and upon his return from five years of military service in 1945 was named assistant director of production planning.

—o—

Appointment of **Lawrence C. Whitsit** as quality engineer of the Kelvinator Division has been announced by Nash-Kelvinator Corp., Detroit. He will co-ordinate the product quality

R. E. WILLIAMS

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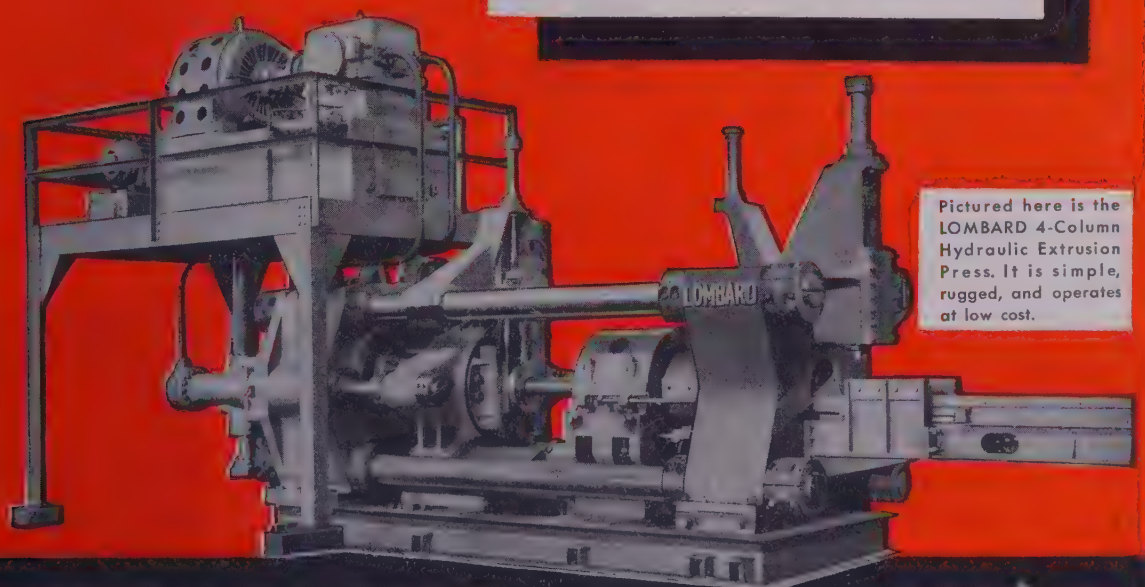

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E. V. RIPPINGILLE JR.

activities of the manufacturing, engineering and service departments of the division at plants in Detroit and Grand Rapids, Mich.

—o—

E. V. Rippingille Jr. has been selected to be president and general manager of General Motors Diesel Ltd., new subsidiary of General Motors Corp., Detroit. Mr. Rippingille was manager of Plant No. 2 of GM's Electro-Motive Division, near Chicago, until Aug. 1. He had been with the Electro-Motive Division since 1937, previously being associated with Cleveland Diesel Engine Division of General Motors.

—o—

Charles A. Kral, recently named general manager of the steel division, Newport Steel Corp., resigned to join Granite City Steel Co., Granite City, Ill. He was also formerly assistant general superintendent of Jones & Laughlin Steel Corp. at Aliquippa, Pa.

—o—

L. E. Tollefson, assistant secretary of Douglas Aircraft Co., Santa Monica, Calif., for the last two years, has been promoted to the position of secretary of the company. He succeeds **T. C. McMahon,** who has reached the retirement age. Mr. Tollefson went to Douglas from Caterpillar Tractor Co. in 1942 and was named manager of contract requirements in 1948. He will continue in that position in addition to his new duties as secretary for the company.

—o—

John S. Seltzer, for the past year manager of customer service and production control, Jack & Heintz Precision Industries Inc., Cleveland, has been appointed manager of purchases and production control. Prior to joining Jack & Heintz in 1948, Mr. Seltzer was associated with Lighting Division, Westinghouse Electric Corp. and later Coil Engineering & Mfg. Co., Roanoke, Ind.

—o—

J. J. Doyle has been appointed manager of electronic tube sales for the Lamp Division, Westinghouse Electric Corp., Bloomfield, N. J. He succeeds **Adolph Frankel,** who was recently named manager of the northwestern district of the Westinghouse Lamp Division. Mr. Doyle joined Westinghouse in 1926 and has held a number of sales positions in the Lamp Division, most recent being manager of electronic tube sales to distributors.

—o—

M. G. Holmes has been elected treasurer, Chicago Malleable Castings Co., Chicago, and its affiliated company, Allied Steel Castings Co., Harvey, Ill. He was formerly comptroller, United States Gypsum Co., Chicago.

—o—

Leo J. Pantas has been appointed works manager of Yale & Towne Mfg. Co.'s Specialities Division plant

LEO J. PANTAS

in Salem, Va. Mr. Pantas, who prior to his appointment served for three years as manager of the company's Buffalo plant, was assigned to his new post following resignation of **Mark A. Miller** as general manager. Mr. Miller has become sales representative of the Stamford Division in Virginia, West Virginia and Kentucky.

—o—

A. E. Bottenfield has been elected vice president in charge of merchandise sales, Whiting Corp., Harvey, Ill. All other officers and directors of the firm have been re-elected for another year.

—o—

A. P. Monroe Jr. has been appointed manager of American Type Founders Sales Corp.'s new Pacific district office in San Francisco. He will handle the sale of all web-fed printing equipment manufactured by American Type Founder's Webendorfer Division plant.

—o—

Robert J. Robillard has been named chief of advanced styling for Kaiser-Frazer Corp., Willow Run, Mich. He had been associated with Aro Equipment Corp., Bryan, O., where he served as chief designer of automotive equipment.

—o—

Cribben & Sexton Co., Chicago, announces appointment of **A. T. Carrow** as Midwest sales division manager. **J. T. Schellenberg,** who formerly held this position, has been transferred to the control division as central division sales manager. Mr. Carrow will make his headquarters in Omaha, Neb., and Mr. Schellenberg will continue at the Chicago office.

—o—

J. W. Thomson has retired after 32 years of service as safety engineer at the San Francisco yard, Shipbuilding Division, Bethlehem Steel Co. Mr. Thomson's overall service with Bethlehem totals 43 years.

—o—

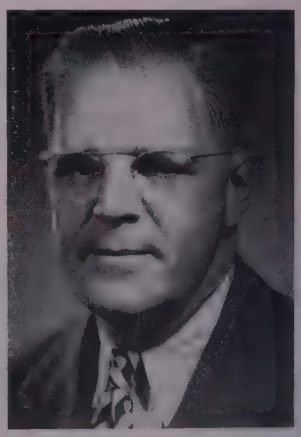
Harold L. Gruehn has been appointed midwest region dealer supervisor for the General Machinery Division, Allis-Chalmers Mfg. Co., Milwaukee.

—o—

John Soelch has been appointed director of purchases for Studebaker Corp., South Bend, Ind. He succeeds **C. N. Rhoutsong** who is now on an indefinite leave of absence after having resigned because of ill health. Mr. Soelch started with Studebaker in 1924 as a clerk in the storeroom and his latest position prior to the new appointment was assistant to the director of purchases.

—o—

Wagner Electric Corp., St. Louis, announces appointment of **R. E. Bryant** as manager of its automotive



JOHN SOELCH

GLENN H. ALBERGA
Appointed plant manager, Laminated Shim Co., Glenbrook, Conn. Noted in STEEL, Aug. 8 issue, p.60

PAUL S. KILLIAN
Appointed vice president in charge of purchasing, Bethlehem Steel Co., Bethlehem, Pa. Noted in STEEL, Aug. 8 issue, p. 61

WILLIAM G. FINDLAY
Named manager, work order division, Joseph T. Ryerson & Son Inc., Chicago. Noted in STEEL, Aug. 8 issue p. 56

nd electrical branch at Buffalo. Mr. Bryant jointed Wagner before he war as a student engineer and fter several years in the armed orces rejoined the company at its lant. Prior to the present appointment he was attached to the firm's Pittsburgh office as a salesman.

—o—

General Electric Co., construction department, Bridgeport, Conn., has named **Harold W. Parrott** as operating manager of its southeastern district warehouse in Charlotte, N. C.

—o—

Orrin G. Meyers, formerly chief engineer, has been appointed sales manager of Hunter Spring Co., Lansdale, Pa. He succeeds **William J. Trendler** who has resigned. Mr. Meyers joined Hunter in 1937.

—o—

R. D. Jablonsky has been named district manager at the St. Charles, Mo., plant of American Car & Foundry Co., succeeding the late **W. C. Roederer.** Mr. Jablonsky joined ACF in 1946 as a welding engineer at the St. Charles plant. He was appointed general superintendent in May, 1948.

—o—

Appointment of **Semon E. Knudsen** as director of the process and development section of the facilities and processes staff has been announced by General Motors Corp., Detroit. He succeeds **Harold T. Johnson** who has been transferred to Overseas Operations Division. Mr. Knudsen, who joined GM in 1939, held a number of executive production positions at Pontiac and was assistant general master mechanic prior to being transferred to his new central office assignment. His headquarters will be at Cadillac Motor Division.

—o—

John G. Caley has been appointed district manager of Mack Truck Co.'s Birmingham direct factory branch. In assuming his new duties Mr. Caley relinquishes those of manager of the national accounts department for Mack's Southern Division.

OBITUARIES . . .

William F. Slomer, 71, former general sales manager of Fellows Gear Shaper Co., Springfield, Vt., died Aug. 4 at his summer home in Hendersonville, N. C. For many years he made his headquarters at the company's sales office in Detroit. Mr. Slomer retired in 1938 because of ill health.

—o—

Warren J. Lynch, a former director and vice president of American Steel Foundries, Chicago, died Aug. 4 at his home in Bronxville, N. Y.

—o—

Harry F. Harper, 68, retired president of Motor Wheel Corp., Detroit, died Aug. 8 in a Lansing, Mich., hospital after a year's illness. He helped to organize Motor Wheel in 1920 and retired as president and general manager in 1946.

—o—

Percy A. E. Armstrong, 66, a leader in development of stainless steel alloys and formerly an executive of Ludlum Steel Co., Watervliet, N. Y., died Aug. 7 at his home in Westport, Conn., after a long illness. He was holder of more than 100 patents, mostly on steel alloys, and devised the process for making silver-chrome steel, a heat resistant alloy, which was widely used for internal combustion engine valves. He was born in England and came to the United States 30 years ago.

—o—

Jacob Stern, 51, executive vice president, Outboard, Marine & Mfg. Co., Milwaukee, since 1936, died Aug. 6 following a long illness. He was a former general manager of Elto Outboard Motor Co. When Outboard Motors Corp. was formed in 1929 as a merger of Elto and Evinrude Motors, Mr. Stern became general manager and executive vice president. He retained these posts when the corporation merged with the Johnson Motor Co., Waukegan, Ill., to form the present company.

—o—

Max Spitzer, 66, founder of the Electrochemical Construction Co., New York, died Aug. 7. A native of Czechoslovakia and with extensive experience in the European chemical industry, he founded the company in 1941 upon coming to the United States.

—o—

William Lloyd, 82, designer of coal stokers and a consultant on stoker engineering for Combustion Engineering-Superheater Inc., New York, died Aug. 7. In 1914 he organized the Coxe Traveling Grate Co. which was purchased three years later by Combustion Engineering.

—o—

R. Dale Benson Jr., 72, former executive of New York Shipbuiding Corp., Camden, N. J., died Aug. 3 in Philadelphia.

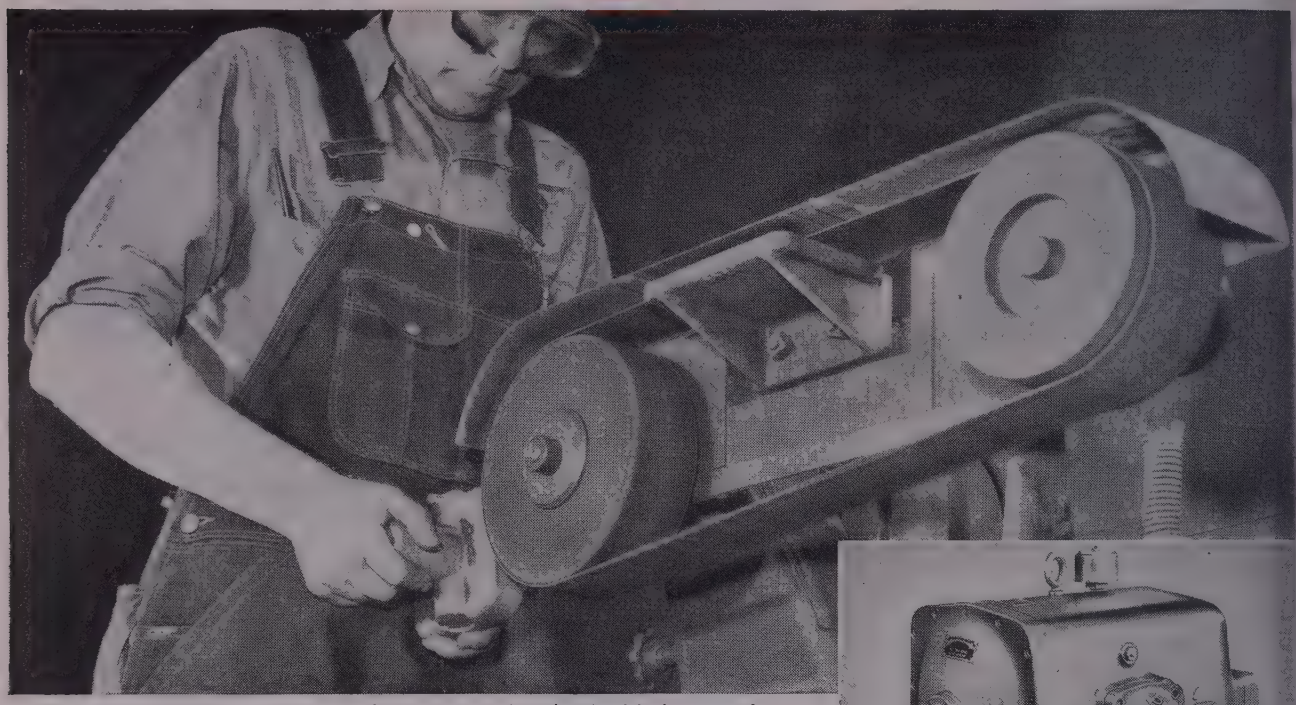
—o—

J. Frank Rogers, consulting engineer for Wellman Engineering Co., Cleveland, died Aug. 8.

—o

Ralph V. Wheeler, 42, cost accountant at American Brass Co., Kenosha, Wis., died Aug. 5.

ANOTHER 3M COMPANY SERVICE STORY



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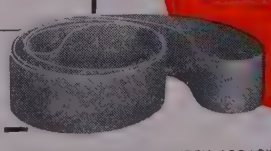

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Engineering News . . . AT A GLANCE

SIMPLIFIES ENAMEL TESTING— Plastic-replica technique of evaluating enamels developed at National Bureau of Standards, Washington, is reported to be an effective method of detecting surface defects as they occur in finishing operations. Method is based on the measurement of the haze of an ethyl cellulose replica of the enamel surface that reveals details seen only with difficulty in the original surface. By using the method, an investigator may follow the progressive breakdown of an enamel surface by making a series of replicas during a test or service period.

TREATS 18-FOOT RADIATORS— Equipment installed recently to facilitate transformer production in the Pittsburgh Works of Allis-Chalmers includes a bonderizing system capable of surface treating fin-type radiators up to 18 feet long. The system subjects each radiator to a timed dip action in successive troughs of cleaner, hot water rinse, bonderizing solution, cold water rinse and fixing bath. Solution temperatures, except for the fourth dip, are controlled between 170 and 200° F depending upon the operation.

"CUSTOM" PRESSES AT STANDARD PRICES— Press buyers will have an opportunity to purchase "tailor-made" units that fit individual requirements close to those prices quoted for "standard" equipment under the latest policy outlined by W. C. Denison Jr., president, Denison Engineering Co., Columbus. Unique plan is possible because all basic units manufactured by the company are designed to accommodate an unusually wide variety of standard interchangeable accessories and other special use components. The added selectivity to buyers is provided without sacrifice of operating or control advantages it is pointed out, regardless of combinations of frame size, ram stroke, etc., chosen.

PROMOTES "TEAM" TYPE RESEARCH— Johns - Manville research facilities, dedicated recently at Manville, N. J., are a far cry from the experimental equipment—a clothes wringer and a tea kettle— on which H. W. Johns, one of the founders, produced asbestos roofing. Housed in four buildings, the center embodies a completely new concept of industrial laboratory design and construction. It includes labs with relocatable walls and built-in services that make them as flexible as movie sets, and product development areas that include as many as 10 pilot plants under one roof in close proximity to locations associated with their products. Arrangement permits close co-operation of scientist-technician "teams" from idea to commercial production.

NO TRUE STEEL TEMPERATURES— Among other conclusions, data obtained from a study of the design and performance of modern large rotary furnaces—sponsored recently by National Tube Co., Timken Roller Bearing Co. and Babcock & Wilcox Tube Co.—indicated that the true temperature of heated steel must be assumed as an approximation. To date, there are no applicable instruments to furnish true steel temperatures. According to the report, all optical readings vary with furnace conditions and kind of surface on the heated steel. Temperature measurements at the center of a drilled piece by thermocouple are believed to be the only true readings taken. The method, however, cannot be applied to production.

EXPERIENCE ESSENTIAL — Although metal spinning eliminates need for expensive dies and presses, and is an economic operation even when involving work in small lots, it still requires plenty of experience and judgment on part of supervisory personnel. According to Craft Metal Spinning Co., Chicago, number and sequence of operations to produce a finished part depend on the shape and area of surface to be spun. In the operation, just as in rolling, the metal is subjected to considerable reduction in thickness. In case of a half sphere spun from stainless, the reduction may amount to as much as 33 1/3 per cent. Therefore, to work out details of a new spinning job, the supervisory engineer must specify the gage of the metal and blank size which will result in the required thickness in the finished part, and its completion without excess metal. (p. 90)

NIPS COST CORNERS—Fact that cost of an average farm tractor today, compared with 1938 costs, is only little more than 20 per cent higher is attributed to resistance welding as a production "tool". Numerous farm equipment manufacturers employing this method of welding found that simpler stampings or forgings could be used to make up complex parts, unnecessary weight could be eliminated and relatively little operator skill was required in processing components faster. At International Harvester's Milwaukee plant, for example, a change to a 2-piece assembly resulted in an annual saving of more than $28,000 in materials and direct labor alone. (p. 97)

"TOWER TREATMENT" —A high frequency inductive field created by coils inside a 20-foot tower is employed during tin coating operations to condition the coated strip for subsequent handling and fabrication without marring. When emerging from the plater, it is revealed, the tin coating has a matte finish. In this state, it is soft and very susceptible to marring by mechanical handling. This condition is corrected by the "tower treatment" which reflows the coating by heat generated in the strip as it comes down past a series of rectangular coils. Following water quench at the bottom of tower, coating is lustrous and has higher corrosion resistance. (p. 114)

Spinning Stainless

Old art of making sheet metal disks into hollow shapes has been developed into an effective, low-cost process for fabricating limited quantities of stainless steel parts such as tank bottoms, half spheres, bowls, strainers, covers for bottling machines, steam jacket kettles

OF THE numerous processes for fabricating sheet metals into finished shapes, one of the rapidly growing but least well known is that of spinning. By definition, spinning is the procedure of making sheet metal disks into hollow shapes by pressing a tool against a rotating form or spinning chuck. As a general rule, metal is spun when required quantities of an article are small, or, in other words, when the cost by other methods of fabrication would be prohibitive. High rates of production are not expected; nevertheless, since the initial outlay for spinning equipment and maintenance of tools is relatively small the process proves economical even for small lots.

Some 12 years ago, Craft Mfg. Co., Chicago, entered the field of metal spinning as an adjunct to its established business as a producer of deep drawings. The new department, as well as the old, grew steadily, requiring periodic expansions in floor space and facilities, finally reaching the point where the company found it desirable to effect a separation between its spinning and drawing operations. Consequently, in May, 1947, the spinning division was reconstituted as the Craft Metal Spinning Co., and moved to Dundee, Ill., where property affording approximately 10,000 square feet of space was acquired.

The company spins all types of metals and in any gages but makes a specialty of those which from the point of view of workability are difficult, for example, stainless steel. Facilities accommodate production of spinnings from thimble size to 84 inches in diameter, but bulk of output falls in the range of 10 to 72 inches diameter. Metal thickness ranges up to 3/16-inch. Typical of spun parts made in the plant are tank bottoms, half spheres, bowls for the food and dairy industries, steam jacket kettles, strainers, covers for bottling machines, parts for air conditioning units, housing trim rings and the like.

An Old Art—Metal spinning is an old art which has been developed over the years into an essential process for fabricating metal. It eliminates the need for expensive dies and presses, and because the finished product is shaped from a single piece of material frequently replaces the welding together of several formed sections. In its extensive experience, Craft Metal Spinning Co. has pioneered the fabrication of stainless steel to the point where any object of round contour can be spun.

Basic equipment for metal spinning is a lathe with a drive on the headstock capable of speed varia-

Parts

By E. F. ROSS
Chicago Engineering Editor, STEEL

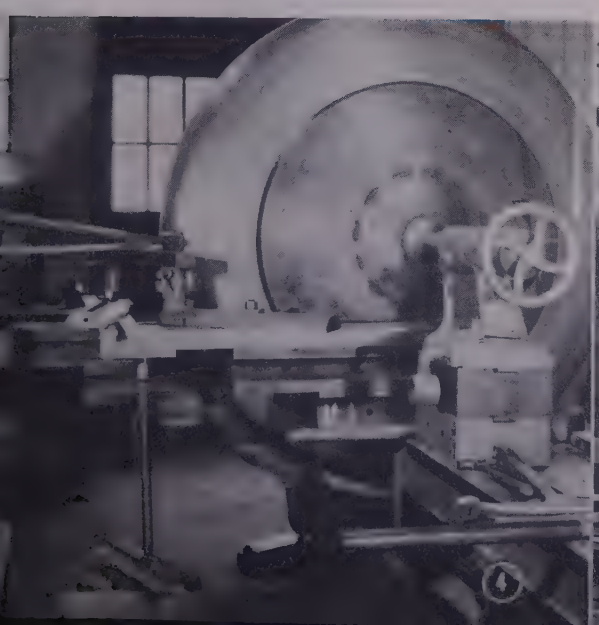
Fig. 1—These two large lathes handle spinnings up to 72 inches diameter. A wood chuck is being turned on the lathe at the right. Leaning against the lathe is a large metal follow block which is used to hold a sheet disk against a chuck during spinning

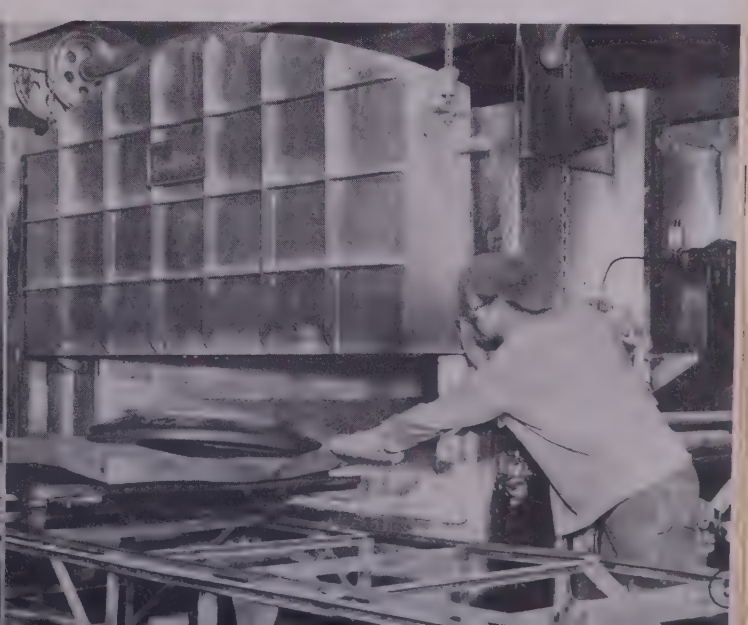
Fig. 2—Battery of five small spinning lathes. Work up to 24 inches diameter is done here

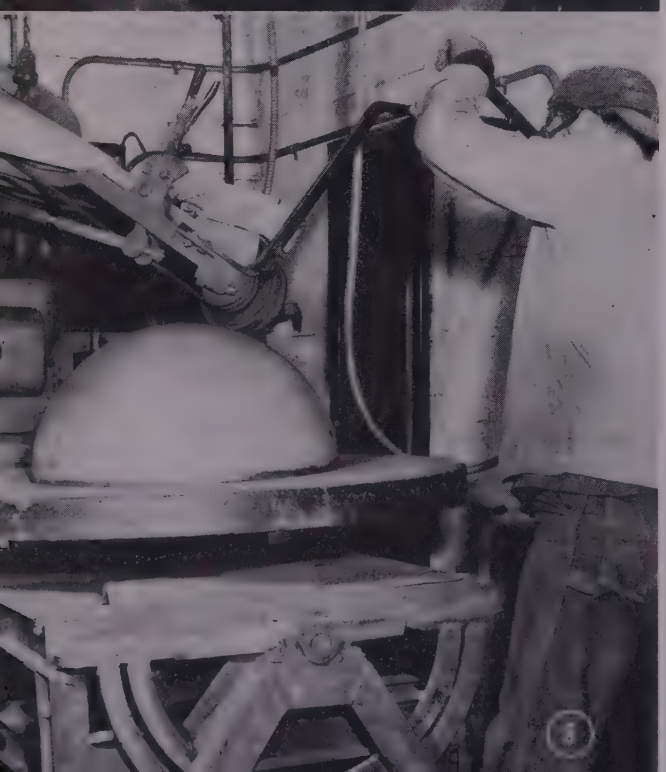
Fig. 3—Light-gage precision spinning up to 24 inches diameter is performed on these two individually-powered lathes. Storage racks for chucks are shown in the background

Fig. 4—Workman here is performing final operation in spinning a large disked and flanged head. Spinning is held against chuck by a large metal follow block

Fig. 5—Spinnings are annealed as required in this gas-fired temperature controlled furnace capable of maintaining 2500° F. Note transfer car which facilitates work handling







tions ranging from 1200 to 2400 rpm. The lower speeds are used for thick and large sections where heavy pressures are required and the higher speeds for thin and small sections. Spinning chucks, or the forms on which the metal is spun, are most commonly made of wood, although they may also be made of cast iron or steel. Metal chucks are employed where it is necessary to work to close tolerances, where finish on the spinning is an important factor, or where production runs are large. Sometimes these metal chucks are chrome plated to provide an extremely smooth planished surface.

Specially-Shaped Tools — Specially-shaped tools, known as spinning rolls or form rolls and of either round nose or roller type, are pressed against the rotating sheet metal to make it conform to the contour of the spinning chuck. These tools, mounted on long handles pivoted on the compound rest of the lathe, are usually made from high carbon steel, and sometimes are chrome plated to improve smoothness of surface and wear.

When the spinning chucks, or forms, are of wood, Craft purchases rough wood blocks built up from glued 13/16-inch layers of hard wood. These blocks are mounted on the face plate of the spinning lathe and are turned to finished size and contour by standard woodworking procedure. The workmanship which goes into these wood forms is very important because considerable pressure is brought against them as metal is spun to desired shape.

Metal for spinning is received at the Craft plant by truck, is unloaded by monorail crane and placed in storage. As required for production, the sheets are removed from stock and sent to the shear department, where they are first squared and then circled. The circled blanks are transported to spinning lathes.

The blank is mounted against the spinning chuck of the lathe either by a center hole in the blank or by follow block, or hardwood pad, supported in the lathe tail spindle. The spinning tools mounted on the compound rest are moved manually into and against the metal section to be spun with just sufficient pressure to deform the sheet into and against the form. Various spinning operations are shown in Figs 1 to 4, inclusive.

Lubricants are used during spinning as required. These may be lard oil, heavy body grease, soap, beeswax or paraffin, depending upon the preference of the operator, speed and pressure employed. In spinning stainless steel, heavy body grease or soap must be employed, keeping the surface well covered to prevent scoring or abrading.

Sequence of Operations—Number and sequence of operations to produce a finished part depends upon the shape and area of the (*Please turn to Page* 112)

Fig. 6—Spinnings are pickled in this carbon block lined pickling tank, 84 inches square and 30 inches deep

Fig. 7—Smaller spinnings are polished in this department. Shown are two lathes equipped with abrasive belts and backstands. Dust is removed by collector

Fig. 8—Large spinnings are polished on this turntable type machine through use of a suspended belt grinder or flexible shaft unit. Turntable has tipping arrangement

NEW MATERIALS IN MACHINE TOOLS: Several weeks ago I mentioned possibilities for sale of modern machine tools to those who machine materials other than metal. During a recent visit to machine tool plants in Cincinnati, I was still further convinced of those possibilities because of the surprising extent to which materials other than metals have crept into the design of machine tools themselves.

As I walked through shops where planers, radial drills, milling machines, lathes, grinders and various other machines evolve from raw materials to finished form, it was driven home to me how far the industry has come from those simple days when ordinary gray iron castings, "machinery steel" and bronze represented practically the whole materials story.

Not only has the metallurgical story become far more complicated, but with the advent of those materials variously known as "plastics" and "synthetics" the nonmetallic story also has become one of great importance.

Without any attempt at complete or orderly listing, let me emphasize what I mean by the following rambling account of some of the nonmetallic details which I saw being built into production machine tools in Cincinnati. Probably the most striking example was the plastic shod platen which is a highly successful feature of planers and planer-type milling machines manufactured by G. A. Gray Co.

Rambling on, I saw antifriction bearings with plastic retainers being assembled into headstocks in several shops. In many cases I saw machines with plastic hand grips on control levers, knobs, cranks and hand wheels. Another common sight was transparent plastic tubing for coolant and for flexible hydraulic circuits. Still in the realm of plastics were the many transparent work, chip and splash guards (once "show" features—now standard equipment).

Synthetic rubber was noticeably important, in the form of "wipers" on ways and slides, as oil and dirt seals on rotating members, as bushings on levers and connecting rods, as cushioning pads and as protective bellows over ways.

A nonmetallic element which I definitely did not see anywhere was the "paper shim". The paper shim passed out of the picture when interchangeable manufacture finally prevailed throughout the machine tool industry. That was indeed a good riddance.

ALUMNUS VISITS SCHOOL: As one of the 60 students who attended the original Machine Tool Sales Refresher Course at Cornell University, July 12-23, 1948, it was with keen interest that I "visited school" at Western Reserve University during the last week in July 1949.

Under regional subdivision of the course worked out this year by its joint sponsors, National Machine Tool Builders' Association and American Machine Tool Distributors Association, the classes which I visited were of the second of four separate and complete five and one-half day seminars so timed that key men of the faculty are able to migrate from one institution to another like roving "schoolmen" of the Middle Ages.

This system certainly makes sense, bringing as it does the benefits of a tremendous amount of time-

SEEN AND HEARD IN THE Machinery Field

By GUY HUBBARD
Machine Tool Editor

tested machine tool marketing experience to more than 350 students divided between Cornell University (July 11-16), Western Reserve University (July 25-30), Dartmouth College (August 8-13) and Purdue University (August 15-20).

Each seminar has been telescoped from the eleven days of last year to five and one-half days without loss of any essential values. This telescoping largely is a tribute to the ability and hard work of Prof. Harry J. Loberg, head of the Department of Industrial and Engineering Administration, Sibley School of Mechanical Engineering, Cornell University. Since July of 1948, when he headed the "faculty", Professor Loberg—chief of this year's roving schoolmen—somehow has found time to distill the essence out of 37 important papers delivered in 1948.

Blending this with liberal amounts distilled out of his own and his staff's experience in industrial engineering and teaching, he has created a textbook which I recommend. It is entitled "Machine Tool Selling". It has put under the 1949 course a solid foundation for individual study lacking in 1948.

Someone once described the beginning of a university as a log with educator Mark Hopkin's sitting at one end talking and an attentive student sitting at the other end listening. By the same token, the beginning of the machine tool industry might be described as a lathe bed at one end of which an apprentice laboriously chips and files the rough casting, at the same time tries to watch Master Craftsman Henry Maudslay scraping the other end to match a surface plate.

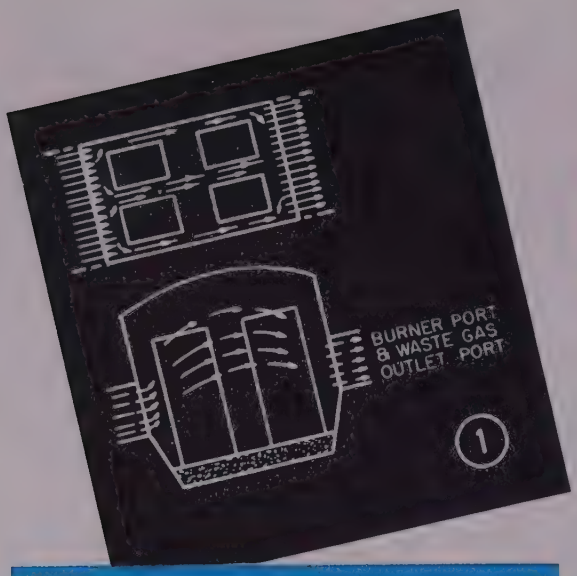
In these days of mass production, a good textbook multiplies and perpetuates the teaching power of Mark Hopkins or Harry Loberg much as modern machine tool multiply and perpetuate the ingenuity and skill of Henry Maudslay, Eli Whitney and their successors.

As one of the "old graduates", I take this opportunity to congratulate Harry Loberg and his "schoolmen", Tell Berna, Mrs. Frida Selbert and Jim Herbert, Bob Giebel and Tom Fernley and all their fellow educators. In the best traditions of the machine tool industry, they have redesigned this Machine Tool Sales Refresher Course to make it turn out six times as many "refreshed salesmen" in 22 days as were turned out in 1948, in eleven days—at the same time cutting unit production cost from $250 to $60.

This investment in education certainly will help every one of these 350 men to do a more effective job of convincing industrialists that modern American machine tools are "The World's Best Investment".

Comparati
MODERN

Factors to consider in the selection of soaking pits are contingent upon which modern pit is best adapted to the peculiar conditions imposed by the installation in question. Firing details of six principle standard types of modern soaking pits are compared



NO one design of modern soaking pit can be considered as universally the best for all heating applications. Consequently, when old pits are to be replaced with units of modern design, or when a completely new installation is to be made, operating requirements should influence greatly the selection of the type of pit to be used.

A modern soaking pit is generally of relatively large size, fully steel encased, thoroughly insulated, usually equipped with recuperators, and has a tight-sealing cover. It has fuel-air proportioning equipment, draft control, and temperature control, all of these controls being easily set and fully automatic in operation. Burners that generate a long, luminous flame are employed, and the pit is designed to allow ample space for flame development while minimizing impingement of flame on the ingots being heated. Forced air is provided for combustion, and fuel pres-

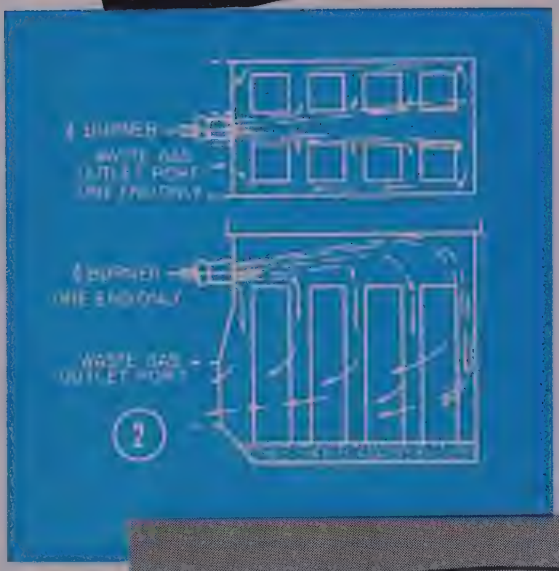


Fig. 1—Modern regenerative type pit

Fig. 2—Top 1-way fired pit

Fig. 3—Top 2-way fired pit

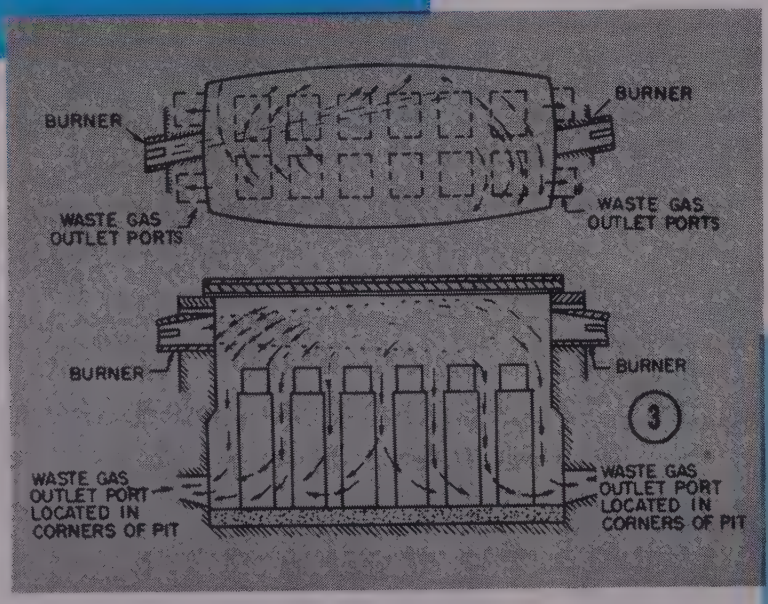
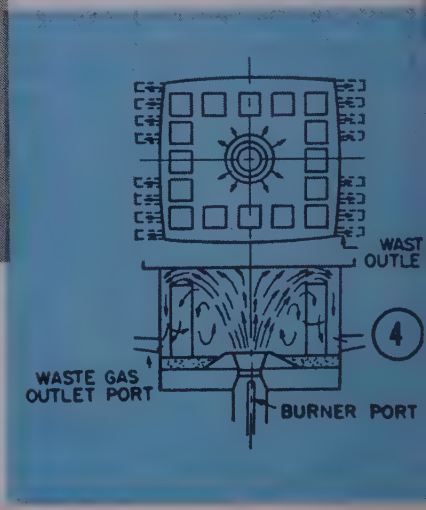


Fig. 4—Vertically fired pit

Fig. 5—Bottom 2-way fired pit

Fig. 6—Tangentially fired circular pit



Advantages of SOAKING PITS

By E. A. BROWN Jr.
Division Superintendent, Fuel and Power
Carnegie-Illinois Steel Corp., Gary, Ind.

sure is automatically regulated if a relatively constant pressure does not exist in the supply lines. Instruments and controls are centralized, insofar as possible, on one panel. Each hole is a complete and independent heating furnace.

Characteristics of Old Pits—In general, old pits are relatively small, rarely if ever jacketed, uninsulated, and generally regenerative. Covers make a poor seal. Proportioning of fuel and air is crudely controlled. Draft control, when provided at all, usually serves a group or row of pits rather than permitting control of the draft on individual pit. Automatic temperature control is lacking or inadequate. Burners consist simply of a pipe emitting gas into a passing air stream. Minimum space is available for combustion, and flame travel is short before it impinges on the steel in the pit. Combustion air is probably induced by pit draft, although forced air may be provided. Gas pressure may or may not be regulated. Instrumentation is usually at a minimum, not centralized, and very frequently limited to a gas meter.

There is also what might be called an "interim" type of pit, which came about by extensive alterations to old pits that resulted in a relatively crude, semi-modern pit when the regenerators were eliminated to permit the use of some type af combustion equipment more susceptible to accurate control.

Basic differences in design and construction between modern and old pits, coupled with the more accurate control possible with the former, result in the following operating advantages in favor of the modern pits:

1. Uniformly heated ingots. This means not only uniform heating throughout individual ingots, but from ingot to ingot and from heat to heat. This contrasts with the relatively variable results obtained from ingot to ingot and from heat to heat with old pits unless extreme precautions were observed.

2. Ingot temperature within a few degrees of the metallurgist's recommendation, based on accurate control by instruments of the automatic type, as compared with visual estimation of temperature by the heater or the use of an optical pyrometer under adverse conditions.

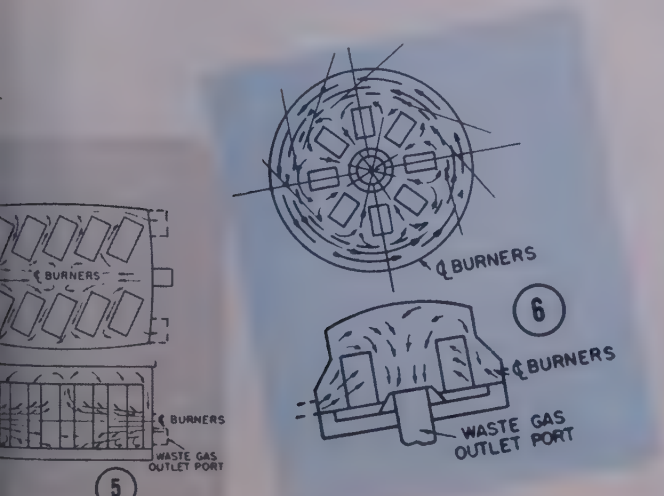
3. Fuel consumption approximating 60 per cent of that required, on the average, by old pits.

4. Scale loss about one-third of that encountered in old pit practice.

5. Based on total building area, a production rate approximately 10 per cent higher per pit row than with old pits. This figure does not relate to production rates based on tons heated per square foot of active pit area.

6. Greatly reduced bottom maintenance.

7. Improved quality of heating, generally beyond comparison with older methods of heating.



Relatively maintenance costs of modern and old pits cannot be intelligently compared, mainly for the reason that most accounting methods in use not only make it difficult to form such comparisons, but also because modern and old pits are generally lumped in the same accounting. Also, plant conditions may be so dissimilar as to make any useful comparison impossible.

It is not believed, however, that modern pits would suffer any by comparison in this respect. In any case, increasing demands for alloy and high-quality steels, and modern competitive conditions, make the use of the best possible heating equipment imperative.

Modern pits do require extensive maintenance of instruments and controls, and such maintenance must be of a high order of excellence. However, the extensive use of automatic controls has relieved the heater of the necessity for almost constant supervision of pit operation, and his time can now be devoted more profitably to direction of ingot placement, pit and bottom maintenance, scheduling of rolling sequences, and observation of instrument records to determine when a heat is ready to roll.

It is not necessary, with automatically controlled modern pits, to view an ingot from the time it is charged until the cover is removed for drawing, provided due care is exercised in locating the control thermocouples. If ingots are to be "drawn on instrument", the control thermocouple for a pit must be located at that point where highest ingot temperature is encountered. It is not sufficient to attempt to control from outlet-flue temperature or any other such arbitrary point.

The only way to make certain that ingots are not overheated or underheated is to place the thermocouple adjacent to and behind an ingot, away from

direct flame impingement, preferably in a wide-angled wall recess.

Admitting the unquestioned superiority of modern pits over older types, it is necessary to examine variations in firing principles and design that distinguish the several types of moden pits, to determine some of the finer points that might influence selection of any one type for a given installation.

Practically all modern pits employ burners that generate a luminous, long flame. These burners are designed so that, instead of immediate mixing of the properly proportioned amounts of fuel and air to cause rapid and intense combustion, the air and gas flows are streamlined so that the two streams mix slowly. This slow mixing of fuel and air results in slower combustion, and a longer flame that emits heat, not intensely in a limited space, but more uniformly over a relatively long path. This permits distribution of heat more uniformly to all ingots in the pit, as compared to intense, localized heating of those immediately adjacent to the burner or port. It should be remembered, however, that once the two gaseous streams from a long-flame burner impinge on the roof or walls of the pit, or on ingots or another flame, and thus become mixed in a sudden manner, combustion is accelerated and completed at the location of the mixing or very near by.

Another principle to consider is that intensely hot gases tend to rise rapidly or, at least, resist descending. Every pit operator is aware that if the bottom of a charge can be properly heated, there will be no difficulty in attaining proper temperature at the top.

There are six principal standard types of modern soaking pits. These may be classified according to their method of firing as: Regenerative, top 1-way-fired, top 2-way-fired, vertically fired, bottom 2-way-fired, and tangentially fired. Each of these modern designs will now be discussed.

Modern Regenerative Pits—This type differs little from old regenerative pits as far as the method of firing and the use of the regenerative principle is concerned (Fig. 1). However, refinements such as jacketing, insulation, tight sealing, and so on, have been incorporated in the design of the modern pits and greatly improved their comparative performance. Modern pits show little improvement in the matter of allotment of adequate space for combustion, and still permit impingement of incompletely burned fuel and air mixture upon ingots adjacent to the ports.

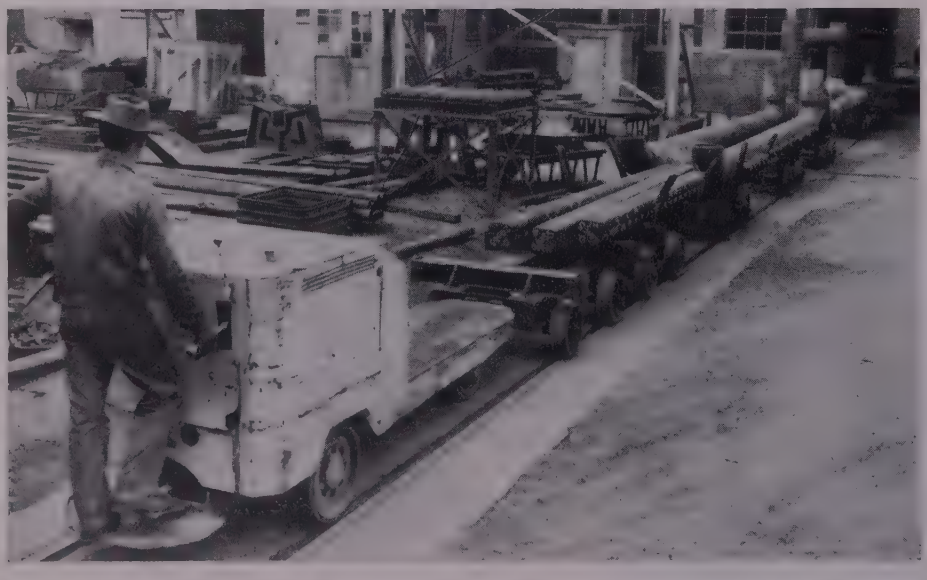
Modern regenerative pits obtain the full benefit of operating each hole as in individual unit, in common with other types of modern pits. This is a great advantage over the old regenerative pits, where two to four holes were generally operated as a single draft unit, necessitating continual compromise to assure average good heating conditions for both cold and ready-to-draw ingots that might have been indiscriminately charged into the various holes of a row.

The modern regenerative pit, as compared to other types, has the handicap of relatively complicated controls because of periodical reversal of direction of firing from end to end. It retains the advantage of full utilization of the hearth area for ingot placement, also characteristic of the old regenerative pits.

Because of unavoidable impingement of flame on ingots adjacent to the ports, this type of pit is best fired with fuel gases having low heating values.

Top One-Way-Fired Pits—In this type of soaking pit, the burner is located at the top, firing above the ingots, and at one end of the pit. The flame is directed into an ample space between the ingot tops and the pit cover. Flame length is dependent upon the firing rate, long in the early stages and shorter in the latter stages of a heat. The hot gases of combustion turn downward between the separate ingots in the charge and sweep back to the outlet ports in the bottom corners of the pit at the burner end, as shown in Fig. 2. Such pits are recuperative.

In addition to ample combustion space above the ingots, this type of pit also has the advantage that the full hearth area is available for ingot placement. Since the use of only one burner (*Please turn to Page* 127)



DOUBLES AS "SWITCH ENGINE": Individuals units or trains of cars traveling on the intraplant system of industrial trackage in the Chattanooga (Tenn.) Division of Combustion-Superheater Inc., are pushed or pulled by battery-powered lowlift platform trucks. It is said that the trucks move loads of 20,000 pounds or more when being used on this detail

FARM EQUIPMENT MANUFACTURING METHODS

. . . and costs improved by resistance welding

Generally considered exclusively a mass production process, resistance welding is now used extensively and to great advantage in the fabrication of tractors and farming implements of all kinds

SINCE the end of the war—and partly as the result of lessons learned during the war—the farm equipment industry has been undergoing a major revolution in manufacturing methods. As one prime result of this revolution, agricultural equipment has had to go up less in delivered prices than almost any other type of manufactured produet. Compared with 1938 costs, the cost of the average farm tractor today, for instance, is only a little more than 20 per cent higher.

In addition, output of farm equipment has been multiplied several times. Tractor production in 1947, it will be remembered, was the highest ever reached by the industry, topping 1946 by more than 50 per cent. 1948 was still higher and almost equalled 1946 totals in the first six months. Plant capacity has increased in nowhere near that proportion. Today's farm implements represent far better values due to numerous improvements incorporated in them. If today's implements and tractors were of the same type that was produced a number of years back, the price comparison, of course, would then be even more favorable.

How has the industry achieved this enviable position? The answers are many, but first among them has been the ingenuity of manufacturers in adapting to their own needs what was once considered a process suitable only to really mass production items. The changeover is not complete as yet.

Resistance welding is a process that was not widely used in most U. S. industries before the war. It is a process by which almost any kind of metal parts can be solidly joined together to form a single part by merely pressing them together and passing an electric current through them. Under these conditions, when correctly applied, the metals flow and fuse together

Data and illustrations courtesy Resistance Welding Institute, Cleveland.

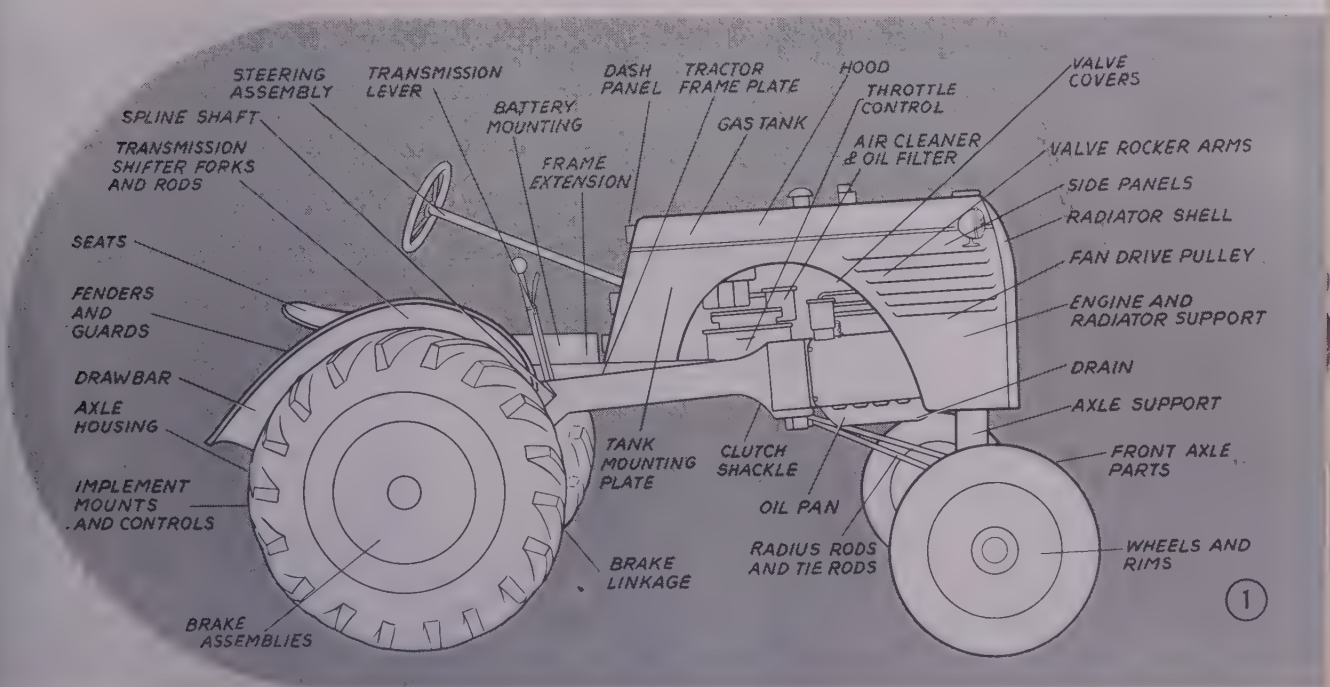


Fig. 1—Drawing of composite tractor showing typical resistance welded parts

and the joint is as strong or stronger than if the part were made in one piece.

Time required to make such a joint is measured not in minutes but in seconds or fractions of a second—sometimes as little as 1/20th of a second or even less. That means higher production per man hour and machine hour in the factory, and lower costs. It means that simpler stampings or forgings can be used to make up complex parts. Many subassemblies can be made so that they are actually one solid piece. Unnecessary weight can be reduced. It has also meant that the industry could expand without tedious training of skilled workmen, since resistance welding requires practically no operator skill.

Without these advantages, it is doubtful that recent production totals could have been attained in so short a time. Other advantages which have accrued are decreased damage to products in service due to greater strength and rigidity; absolute uniformity of the welded assemblies; elimination of warping or distortion and of strains set up by such warping, etc.

It is true that resistance welding was used to a limited extent prior to the war, but the use was fairly small. As a matter of fact, all of the U. S. metalworking industries together purchased in 1938 or 1939 less than one-fifth of the amount of resistance welding equipment installed last year!

Perhaps one of the first items of equipment to undergo major changes was the tractor. It would be impossible to show here every tractor part which is produced today by one or more manufacturers through resistance welding. In Fig. 1 some of the parts have been indicated. One tractor producer states that on one model some 300 resistance welds are used.

Tractors—Typical of tractor parts which have lent themselves to increased production at lower costs are gas tanks. An idea of what has been accomplished comes from Allis Chalmers Mfg. Co. At their West Allis, Wis. plant, this company boosted production from one gas tank in 15 minutes to one tank every 3½ minutes by seam welding on standard seam welding equipment. In addition, the relative skill required of the operator is much less since the seam welding method automatically produces a tight joint without being dependent on the human element. This is evidenced by field reports that indicate practically negligible troubles on seam welded tanks. The seam is over 5 feet long.

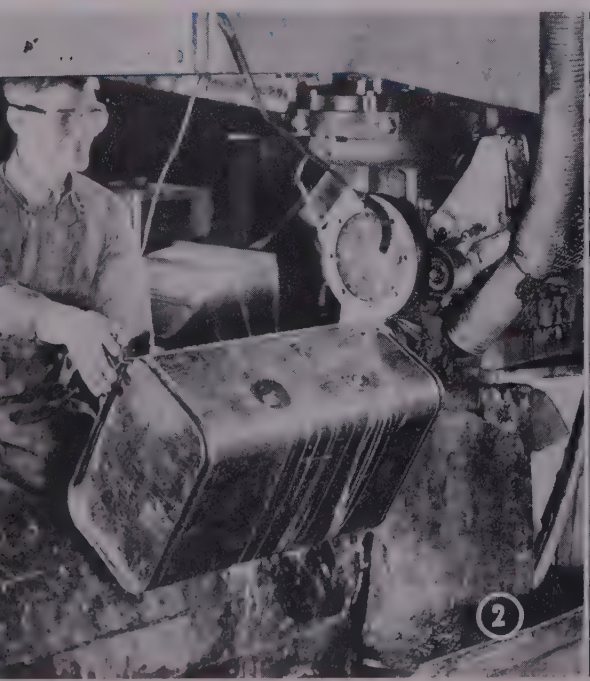
To seam weld these 20-gage steel tanks, Allis-Chalmers had the ingenious idea of using half a tank, with the flange cut off, as a "locating fixture". The tank to be welded is just dropped into this fixture, which fits it perfectly and holds it accurately in place, so that all tanks are exactly alike.

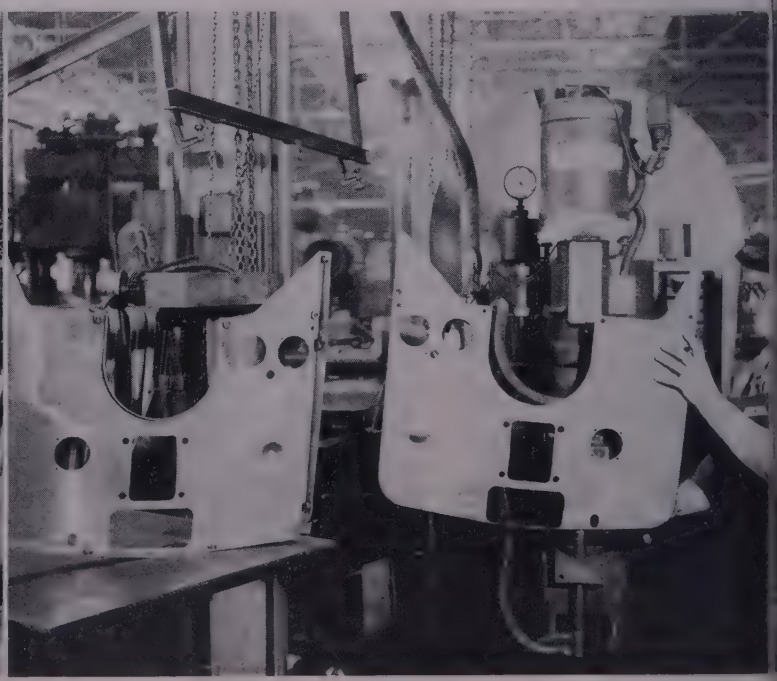
Fig. 2 shows an actual operation of welding a gas tank at Massey-Harris Co. Resistance welding here not only produces much stronger and better constructed tanks than before, but has eliminated several operations, resulting in substantial increases in production and lowered costs. The tank is made of steel stampings, seam welded together. The internal reinforcing members are spot welded in place prior to the seam welding operation.

At John Deere, even the gas tank mounting plate—for attaching the tank to the chassis of model A, B and G tractors—has been improved by resistance welding. For the IHC Farmall tractor produced at International Harvester's Milwaukee plant, for instance, the change to a two-piece assembly resulted in an annual saving of more than $28,000 in materials and direct labor alone. The parts formerly

Fig. 2—Seam welding tractor gas tank

Fig. 3—Projection welding assembly of tractor dash panel





ost 23.3 cents each to manufacture. Resistance weld-
ıg reduced this to 10.5 cents each, or less than half
ıe previous cost. The plate is a simple stamping,
hile the tapped cylindrical part is designed to be
ırned out by the hundreds from bar stock on an
utomatic screw machine. Ridge on the inner face
f the cylindrical part forms the "projection" through
hich the piece is welded to the plate.

On another gas tank, of "concealed" design, as
sed on the Ferguson tractor, simple formed sheet
ietal is used to produce the wrap-around section
nd the two ends, all of these being seam welded
o form a tight seal. The tank support bracket on
his tractor is also made, integral with the battery
ılatform, by spot welding, to give a stronger, simpler,
ighter and materials-saving construction. To mount
his assembly, weld-nuts are projection welded to the
attery platform.

Where nuts and bolts are required, resistance weld-
ng plays its part today. A good example, Fig. 3,
hows the assembly of a dash plate or panel produced
t the Peoria, Ill. plant of Caterpillar Tractor Co.
On this panel there are from 14 to 19 nuts (depend-
ng on the type of tractor) for mounting the panel
tself and for mounting the instruments. The com-
any merely resistance welds nuts to the plate, at
rate of 25 to 29 complete plates per hour. On the
4-nut panels this meant stepping up the production
rom one every 8 minutes to one every 2 minutes—
our times the previous output.

Caterpillar among others also uses resistance weld-
ng to attach reinforcing strips to the hood center
ection and has boosted output on this operation from
per hour to 15 per hour as a result of the change.
n addition, a former straightening and hand-grind-
ng operation has been eliminated as the result of the
mooth finish and lack of distortion resulting from
he use of spot welding. There are 16 spot welds at-
taching each strip to the panel, which gives an idea of the speed with which these welds are made.

Under the Hood—Looking under the hood, we find one particular part which really has to stand the gaff on the average tractor: The drain plug assembly for the oil pan. To provide a solid support for the drain plug, International Harvester projection welds a $\frac{3}{8}$-inch thick, $1\frac{1}{2}$-inch diameter "spud" or retainer to the oil pan on its Farmall engines. This ring is tapped with a pipe thread to receive the plug. When the ring is pressed against the oil pan and the welding current is turned on, the weld starts at the circular projection and works toward the inside and outside of the ring to form an oil-tight joint, strong enough to resist such blows as are encountered when the drain plug hits a rock or a stump. The operation is so fast that one operator with the simple machine which does this job can turn out from 130 to 200 assemblies per hour.

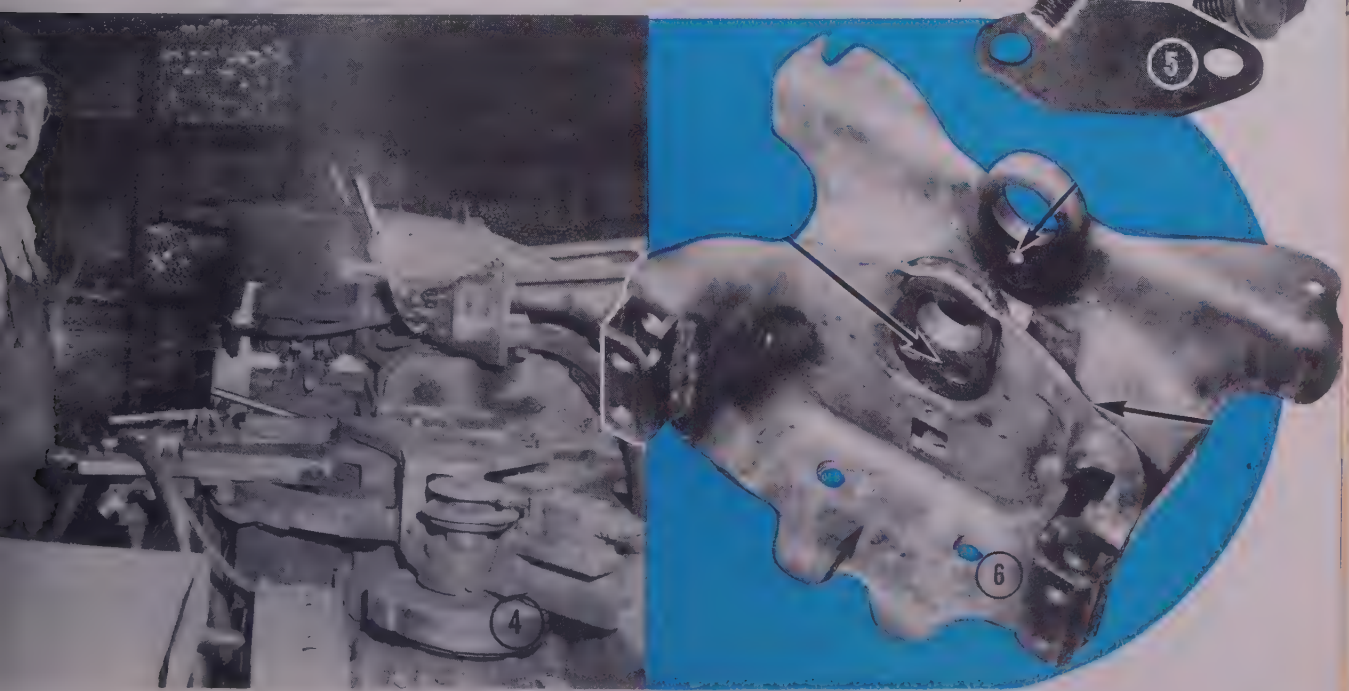
Another typical engine part that lends itself to resistance welding is the oil pan drain cover assembly produced by International Harvester. This assembly, shown in Fig. 5, is composed of a $\frac{1}{8}$-inch thick plate to which are attached two heavy studs. The new practice is to use studs having a ring projection under the head. These are dropped into the holes and projection welded in place so fast that the simple change in processing has resulted in a very considerable saving per assembly.

A number of other engine parts and accessories, such as air cleaners, trottle control linkage, valve

Fig. 4—Flash welding tractor radiator support clevis

Fig. 5—Resistance welded tractor oil pan side drain cover

Fig. 6—Front axle support showing location of spot welds



rocker arms, fan pulleys, oil cleaners, oil pans, valve covers, front end cover plates, etc., are all produced in large part by resistance welding, in this respect following practice in the automobile and truck industry. The valve rocker on the Ferguson is made from two stampings, a left and a right, projection welded and brazed together.

While there is considerable variety in the construction of tractor seats, there is a tendency to increased use of welded construction in all types—for lightness and comfort. One reason is that lighter gages can be used, more easily formed for maximum comfort and then these can be reinforced by spot-welding reinforcements to them. The welds form no projections to interfere with seating comfort as would be the case with riveted or bolted construction.

Front Ends—Moving forward to the radiator, the radiator support clevis is now fabricated by International Harvester from two pieces by flash-butt resistance welding. This permits making the clevis of two simple pieces: A bent stamping with a little button on the rounded portion and a threaded rod. To make one piece out of these two, they are placed in a flash welder, Fig. 4 and pressed together while the welding current is on. This fuses the two parts together into a single solid assembly. The new design is stronger, simpler to produce and saves about 15 to 20 per cent in the overall cost of the finished part.

Another illustration of how a part made of several pieces instead of one, simplifies the assembly and greatly reduces the final cost, is in the tie-rod wish bone for the Farmall. Now the ends are turned out by simple drop hammer forgings and are butt welded to the wish bone. According to IHC, the savings in handling cost were "enormous."

Front axle supports on several tractors are constructed from stampings resistance welded together. These "stampings" are heavy gage—running as much as ¼ and ½-inch thick—to provide the structural strength needed. A typical case is in connection with the Ford tractor. The present front axle support, produced by resistance welding, is not only lighter and lower in cost to produce, but is decidedly stronger than the former part.

According to the manufacturer, not a single reject had been encountered when a check was made after the first 15,000 units had been run off. Labor required was 2 man hours for 100 resistance welded assemblies.

Another front axle support used on the new Ferguson tractor is shown in Fig. 6. This is assembled almost entirely by spot welding, the welds being located at the points shown. There are two main stampings, the rear one overlapping under the bottom of the front stamping and spot welded to it to form a section about ½-inch thick. The two forged reinforcements which carry the pivot pin are ½-inch thick, each, and are spot welded into pockets in the main stampings to make a total thickness of about ¾-inch at the welds. The attachment brackets at the left and right are the only parts not resistance welded. Ferguson says that the welded assembly has given them the lightest, strongest and most economical-to-produce construction they have been able to find.

Other Parts—Another front end part now produced by resistance welding is the steering worm and shaft assembly on the Farmall. This is produced by flash welding the steel forging in which the worm is cut, to a ⅞-inch diameter steel rod, thus giving the entire assembly—up to the steering wheel—the strength of single-piece construction. Repeated quality tests have proven the weld joint equal or superior to any other part of the shaft, according to Harvester. The process is so fast that one man can produce over 50 assemblies per hour, operating not only the welding machine but also the lathe which trims off the flash after the weld. A similar construction is used to assemble the steering pinion to the column shaft on the Ferguson.

Again, on the Ferguson tractor, such front end parts as radius rods and pivot pin assemblies are all produced by flash welding forgings to tubular shanks. This practice, incidentally, in addition to providing lighter weight with high strength, also eliminates the necessity of considerable machining, further reducing the cost. Thus the radius rod is actually an unmachined tubular part to the ends of which the clevises and balls are resistance welded.

(To be concluded)

Floor Loading Test For Power Trucks Made

A quick method for approximating safe floor capacity when subjected to power-truck operations is provided by new data made available by Yale & Towne Mfg. Co., Philadelphia. Intended to guide industry in choosing and operating industrial power-trucks, the new data helps the engineer to choose equipment in permissible weight ranges and to select suitable unit-load weights for safe operations.

Tests made by the company show that common types of industrial power trucks in use today impose a dynamic load to the floor of approximately 1½ times the static weight of the loaded machine. Considering the truck as a concentrated load, the bending moment is about 2 times the bending moment for uniform loading. These two factors are said to indicate that industrial power truck operations introduce floor stresses of 3 times those presented under uniform loading conditons.

An example of the truck load which a floor will carry is given in the following example offered by Yale & Towne: A 20 x 20-foot bay having a 10-foot aisle and rated floor capacity of 250 pounds per square foot would allow a static load of 20 x 10 x 250 pounds per square foot or 50,000 pounds. Applying the factor of 3, this would allow a truck weight of 16,600 pounds. How much of this weight will be apportioned to truck and how much to load will depend upon the type of load and upon the type of truck used.

Electricity Slidefilms

Twelve discussional-type slidefilms on basic electricity for use in the school shop, for apprentice training and for foremen's meetings are available from Jam Handy Organization, Detroit 11, Mich. Films, which provide material for the instructor in the form of photographs, drawings and diagrams, cover the following subjects: Magnetism, static electricity, current electricity, the electrical cell, the storage battery, electromagnetism, generator, alternating current, electric motors, electric meters, and applications.

MESTA forgings

Mesta facilities are capable of producing the largest forgings used by industry, with rigid quality control, from raw materials for producing carbon and alloy steel ingots to completion of the finished product.

The illustration shows a 70 foot forged steel column, for a 14,000 ton forging press, being turned and bored on a Mesta 84" lathe.

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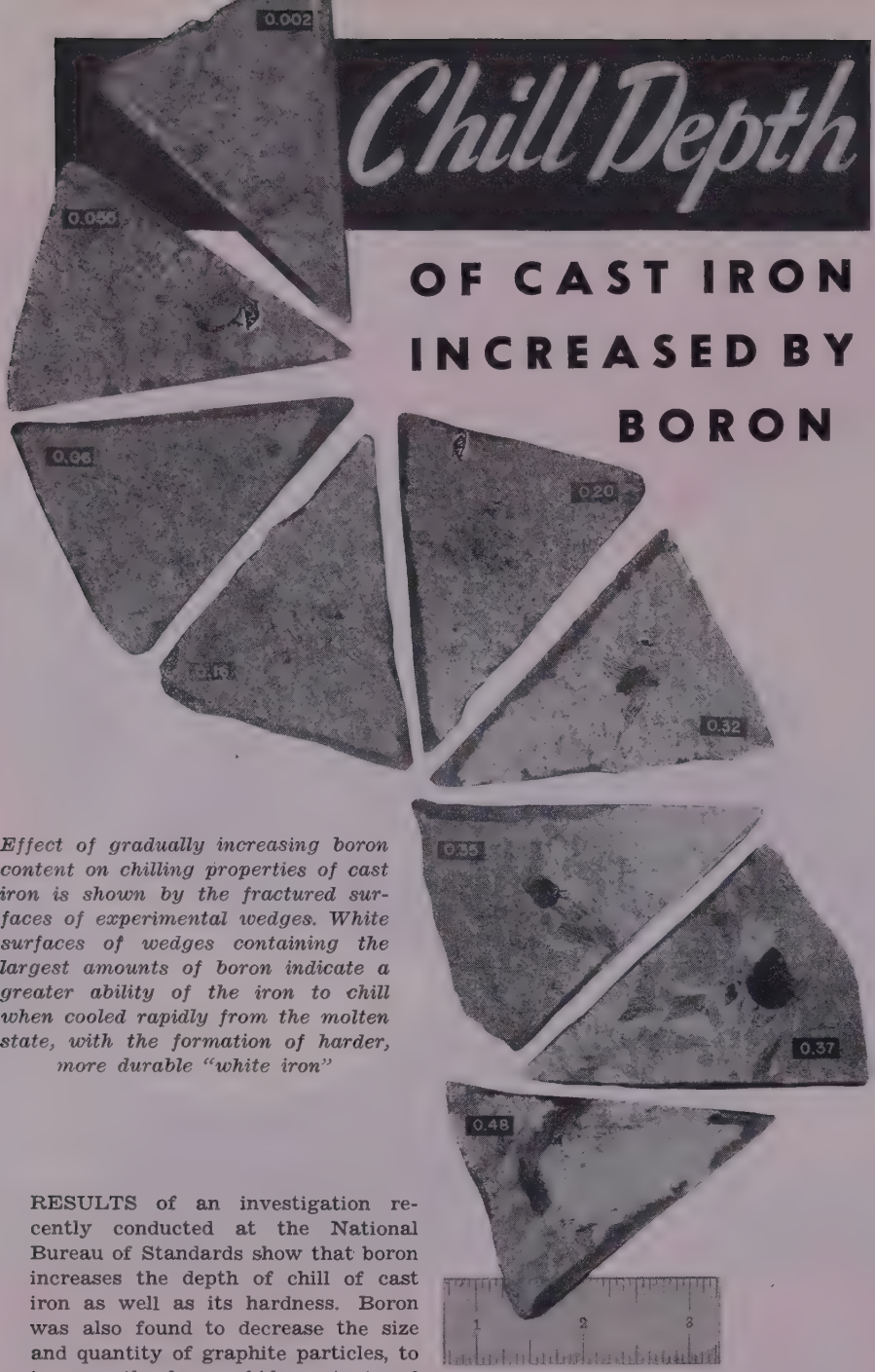
Chill Depth OF CAST IRON INCREASED BY BORON



Effect of gradually increasing boron content on chilling properties of cast iron is shown by the fractured surfaces of experimental wedges. White surfaces of wedges containing the largest amounts of boron indicate a greater ability of the iron to chill when cooled rapidly from the molten state, with the formation of harder, more durable "white iron"

RESULTS of an investigation recently conducted at the National Bureau of Standards show that boron increases the depth of chill of cast iron as well as its hardness. Boron was also found to decrease the size and quantity of graphite particles, to increase the free carbide content and to produce an undercooling effect which becomes more pronounced with greater percentages of boron.

Cast iron consists essentially of graphite particles dispersed throughout a steel matrix. Ordinarily the fractured surface of the metal is gray, giving rise to the term "gray iron"; but when cast iron is cooled rapidly from the molten state, it "chills," forming "white iron." Because of its hardness and resistance to wear, white cast iron is used in such articles as street-car wheels and rolls for rolling mills.

Core of these castings consists of soft gray iron while the outside portion is the more durable white iron. Brittleness of the iron chip and the lubricating properties of the graphite make gray iron easy to machine. The graphite particles also act as cushions against thermal shock and thus prevent crazing. For this reason, gray iron is the only material that has been successfully used on a large scale for brake shoes or brake drum linings, which must absorb tremendous energy, convert it to heat, and still not seize the wheel or axle.

Nine Gray Irons Studied—In the bureau's investigation, plain gray cast irons of nine different stocks were studied. The carbon content in these irons varied from 3.3 to 4.1 per cent, silicon content from 1.4 to 2.7 per cent. The irons were melted in high-frequency induction furnaces, and boron in the form of ferroboron was added to the molten metal in amounts ranging from less than 0.001 per cent up to 0.48 per cent. Green, dry, and core sands were used in preparing the molds.

Solidification characteristics of a number of heats were determined by making "inverse rate" cooling curves under as nearly uniform conditions as possible. The curves indicated that undercooling increases with an increase in boron. At higher percentages of boron, the composition seems to approach a eutectic point, where the liquidus and solidus are merged.

When examined under a microscope, the structure of irons with a relatively large boron content was found to consist essentially of a matrix of cementite (Fe_3C) containing islands of pearlite (a mixture of ferrite and Fe_3C) as well as other structureless islands. The pearlite areas were usually surrounded by a structureless band. In order to ascertain the nature of these various structureless islands and envelopes, a series of experiments, consisting of a liquid air quench, an annealing treatment, and magnetic studies, was carried out. It seems probable that the envelopes surrounding the pearlite areas are ferrite while the structureless islands are very fine pearlite which could not be resolved by the microscope. It is also probable that the various constituents — pearlite, ferrite, and cementite are of a complex nature, containing boron in solid solution or in the form of a compound.

Breaking Test — Transverse strength was determined by subjecting bars 1.2 inches in diameter to a breaking test. A disk ¾-inch thick was then cut from each broken transverse test bar adjacent to the fracture and used for Brinell hardness determinations and for metallographic examination. Fractures could be classified as gray, white-network, or mottled. For bars with gray fractures, an increase in boron content was accompanied by a small increase in the transverse strength, Brinell hardness, and relative modulus of elasticity of the sample. However, the appearance of a white network or white specks on the fractured surfaces of bars containing larger amounts of boron usually was accompanied by a drop in the transverse strength and deflection, and increase in the Brinell hardness and relative modulus of elasticity. Brinell numbers varied from 140 to 220 for

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bars with gray fractures, from 220 to 285 for bars having a white network, and from 295 to 427 for those with mottled and almost white fractures.

Another very important property of cast iron is its ability to chill with the formation of white iron. Depth of chill may be controlled in two ways—by varying the cooling rate or by adjusting the composition of the iron. In the present study the whiteness of the fractured surface of plate and wedge specimens was taken as a criterion of the iron's susceptibility to chill. Plates 4 x 4 inches square and ½-inch thick were cast with one edge against a heavy iron chill block and were broken at the middle, perpendicular to the chilled side, to measure the depth of chill. Wedge specimens 2½ inches wide at the base, 3 inches high and 4 inches long, cast in dry sand molds, were also broken at the middle.

Increase in Chill Depth—For all castings made under similar melting and pouring conditions, there was a pronounced increase in depth of chill with an increase in the boron content (accompanying photo). This was found to be accompanied by a greater development of the white network in the gray portions of the castings. The chilled areas of the plates usually consisted of two zones: A completely white zone, known as "clear chill," and a partly chilled or motted zone. For irons containing a large amount of boron—0.32 per cent and higher—the chill plates proved inadequate for measuring the depth of chill. Fractures of plates containing 0.32 and 0.35 per cent boron were mottled white while those containing 0.37 and 0.48 per cent boron were wholly white. In the wedges containing 0.35, 0.37, and 0.48 per cent boron the mottled zones were absent, and the white portion of the wedge containing 0.48 per cent boron consisted of a massive columnar structure.

Vickers hardness determinations made on the white portions of the chill-plate specimens showed an increase in Vickers number with an increase in boron content. For the chill plate containing 0.48 per cent boron the Vickers hardness number was 721—corresponding to a number between 620 and 650 on the Brinell scale—while for regular white iron the Brinell hardness number lies between 320 and 530.

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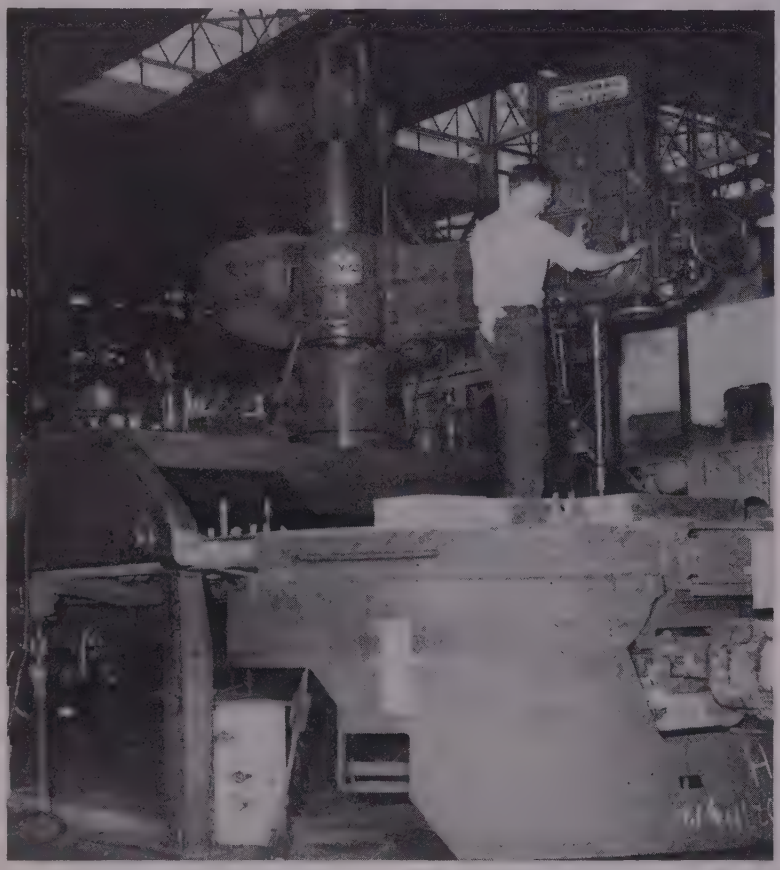
For more complete details, see "Effect of boron on structure and some physical properties of plain cast irons," Alexander I. Krynitsky and Harry Stern, J. Research, NBS, 42, 465 (1949) RP1987.



BED PLATE DRILLER—This double-column radial drill in the plant of Electro-Motive Divsion, General Motors Corp., LaGrange, Ill., speedily drills and taps 62 holes in the bed plate while resting on the two side rails of a diesel electric locomotive frame. Including setup, time required for both operations is approximately 3 hours per frame—the templet-located holes ranging in size from ¼ to 1¼ inches diameter. Machine base spans 110 inches and is mounted on wheels connected to an electric motor drive for movement along frame. An overhead crane is used to move the drill from one frame to another. The machine and a duplicate recently installed in Electro-Motive's new switcher locomotive plant, Cleveland, are understood to be the only ones of their type in existence

Industrial Brake Lowers Maintenance Costs

Lowered maintenance costs in excess of 50 per cent have shown up from the installation of an airplane-type single disk brakes on mine shuttle cars. The industrial brake, developed by the Goodyear Tire & Rubber Co., Akron, O., has been undergoing a one year testing program in co-operation with Joy Mfg. Co. It was stated that on the test car, 96,-131 tons of coal are hauled in the car in less than a year without a brake failure.

The Joy Co. is installing the single disk brake on all of its shuttle cars, continuous miner and some loading machine models. It is also available for installation on older model machines now in service. The nonself-energizing brake is said to give a soft-cushion braking action and has a straight line torque curve throughout the braking range. It gives equal torque in both directions. A self-adjusting feature is said to enable operators to enjoy a permanent pedal stroke at all times.

Screen Slide Table

Condensed conversion data for punched screen plate, wedge wire screen and screen wire mesh is incorporated in a pocket-sized slide table offered by McNally Pittsburg Mfg. Corp., Pittsburg, Kan. Data is correlated for inches, millimeters, U. S. wire mesh and Tyler wire mesh. By means of a slide each measure can be converted to decimal inches and microns in the range from 1 inch to 400 microns.

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Planned Lubrication

. . . yields multiple benefits stemming from more efficient machine maintenance

Fig. 1—Lubrication procedures start in the oil-house. Delivery of clean and correct lubricants to machines depends upon good storage and handling

HOW to get the most out of lubrication is a question that never remains static.

The metalworking industry is constantly changing, with new methods, new machines, new methods adapted to old machines, changing and shifting personnel, the need for stepped-up preventive maintenance, conservation of lubricants, lower lubrication costs, more effective lubrication results. All of these things, along with other factors too numerous to mention, paint the need for a planned lubrication program which will satisfy the ever-changing lubrication needs of any plant. With such a plan in force, management has a well-thought-out program for seeing that each bearing, cylinder, and gear on every machine always receives proper lubrication.

To see that this is accomplished, lubrication engineers believe seven steps to planned lubrication can chart the course. They are based on recognized principles of industrial efficiency, and determine objectives to be accomplished, outline procedures to be followed and detail the responsibility for getting the job done. They are felt to comprise a fundamental approach to the better lubrication of all machines.

Experience in many plants shows three prerequisites are essential: A firm decision on the part of plant management to emphasize lubrication and support a lubrication program in the plant; consultation with and purchase of oil and grease from a company that makes quality lubricants and employs competent and skilled lubrication engineers; and establishment of a co-operative and continuous working partnership between plant personnel and the oil company's lubrication engineer so that the user's knowledge of his machines and their operation can be pooled with the oil supplier's knowledge of lubricants and lubrication methods.

Therefore, the following steps outline the strategy many plants follow in combatting friction and wear.

Step 1—Get the facts on lubrication and lubrication practices in your plant. Have a lubrication study made of all equipment by a skilled lubrication engineer in co-operation with plant personnel. This is necessary because correct lubrication embraces many things in addition to the simple application of oil or grease to each machine.

The lubrication study should include an analysis of production losses and maintenance expenses attributable to inadequate lubrication. The benefits, improvements and profits to be realized if machine parts ride on the right film of oil or grease must also be evaluated so later progress can be measured.

Furthermore, such a study should encompass a review of how lubrication is handled throughout the plant from the time lubricants arrive in the stock room until they are put in the machines. Practices followed in cleaning and refilling important circulation systems are also worthy of emphasis, as are maintenance of lubrication records and preventive main-

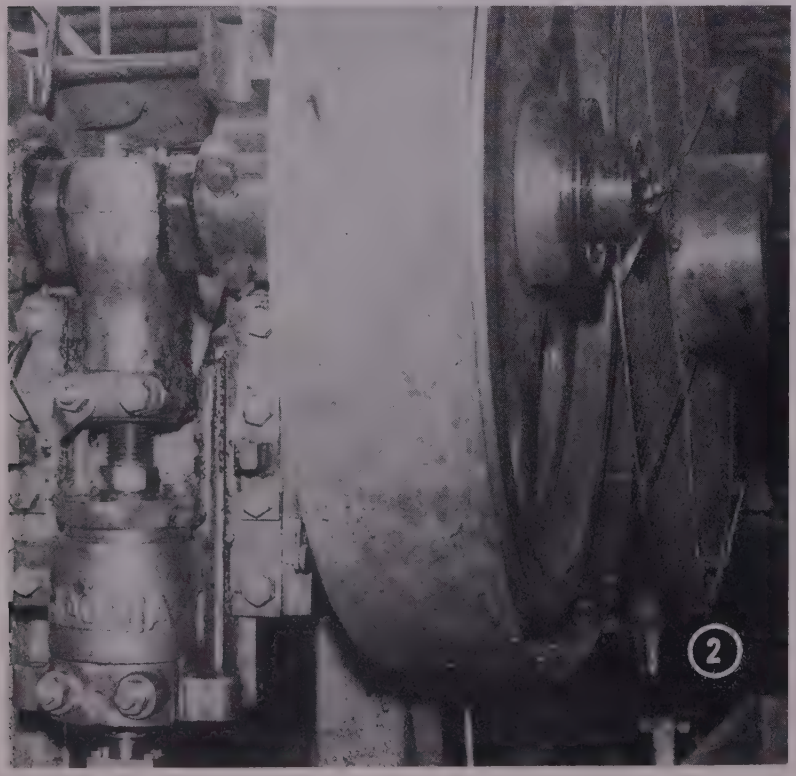


Fig. 2—A lubrication study on this machine showed that the fly-wheel hub required a bearing replacement twice a year. A slight change in the method of lubrication and replacement of a conventional grease with another type extended bearing life four times

tenance practices of oiling personnel.

Step 2—Establish lubrication recommendations. With a more-or-less complete set of facts it is then possible to sit down with the lubrication supplier and decide on what and how many brands of oil and grease are to be used throughout the plant. Stress should be put on the adoption of as few brands of oil and grease as possible. A skillful lubrication engineer will make recommendations based on operating conditions revealed by the lubrication study, experience of your plant people, advice of the machine builder and his own special knowledge of lubricants and their performance in similar equipment elsewhere.

Complicated though the selection and recommendation of specific lubricants may seem, the process of selection is in a great measure dependent on the skill of the lubrication engineer. He will usually prepare lubrication charts covering every piece of equipment for the guidance of everyone interested in stocking or applying the oils and greases. With the establishment of specific lubrication recommendations by brand for each machine, the groundwork for the application of the right lubricant in the right way to the right place is laid.

Step 3—Develop lubrication procedures. Based on steps 1 and 2, this can be readily accomplished. Basic elements involved are men, lubricants and machines. The men—the oilers—should be equipped with a copy of all charts, given a fundamental education in basic principles of lubrication by the lubrication engineer, given on-the-job instruction in good lubrication practices, instructed in ways and means of reporting the need for machine maintenance as observed while oiling machines and periodically consulted by their superiors or the lubrication engineer on all details connected with the lubrication carry-on.

The day when "shop flunkies that could not read or write" are selected for oilers is fast aproaching an end. Oil company reports show that industrial management is increasingly realizing that oiling personnel are the most valuable "eyes and ears" in the plant. They can, if properly trained, catch mechanical troubles in the "incubation" stage and prevent serious and expensive maintenance later. This is an all-important by-product of the routine oiling duties.

Lubricants, the second basic element in developing lubrication procedures, should be stored in a clean, well ventilated, controlled stock room or "oil house." They should be kept clean at all times and carried into the plant in cans, guns or oil-handling equipment which is properly identified. When, as used oil, the lubricants are returned for filtration and reuse, they must be properly identified also.

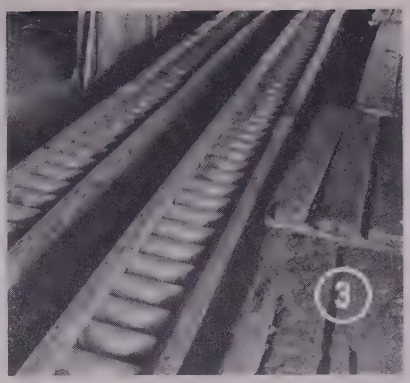


Fig. 3—Evaluation of the benefits of planned lubrication showed that maintenance on this hot iron conveyor was cut 60 per cent, at an annual saving of $2310

As for machines, the lubrication plan should embrace education of the oilers in the use and care of all the simple lubricating devices, the proper method of lubricating antifriction bearings, the proper methods of flushing and cleaning circulation systems and safety practices while lubricating each machine.

Step 4—Establish ways and means of keeping ahead of schedule. This demands two things: Supervision of lubrication in the plant by a man appointed by management; and follow-up by the lubrication engineer at periodic intervals. Supervision is a must because lubrication, like anything else related to production and maintenance of equipment, will not shift for itself. When lubrication is made the business of one individual, either as a full or part time assignment, it is made much more effective.

Such supervision should be directed to the oilers and their activities so that they use the right lubricant in the right way at all times, that circulation systems are flushed and changed at proper intervals, that on-the-job training of oilers is carried out, that lubricant consumption records are maintained, that preventive maintenance practices are followed, that close co-operation with lubrication engineer is maintained.

The lubrication engineer should make a periodic review of results and methods and make specific recommendations to improve lubrication as conditions change, new machines are added, or developments dictate. Such recommendations may deal with changes in previous recommendations, use of a more suitable lubricant, application of an oiling device, redesign of a bearing for better lubrication, construction of a filter, establishment of a petroleum-testing program to extend the service of oil in a circulation system, or recommendations to reduce oil or grease consumption.

Step 5—Route work of the oiler is an important step in the maintenance of lubrication efficiency or reductions in labor costs for oiling. To simplify routing of the oiler, on-the-job training by the lubrication engineer or the plant personnel supervising lubrication will usually dictate the development of a work plan for him. The work plan should include a timetable, a method of carrying needed supplies with him at all times, and a method of arranging for advice on important lubrication details to be handled during each day's work.

For example, to develop a timetable for oiling personnel is to assure that each important lubrication task is fulfilled on schedule with an economy of effort. Without a timetable the oiler will be all places at all times and some vital bearing will be sure to suffer in the long run.

Having supplies with him is a sure way of reducing much unnecessary walking and wasted motion. In large plants with a great number of machines, lubrication carts carrying a supply of lubricants, containers, waste, tools, charts, etc., can be designed and built for specific purposes, or purchased. In smaller plants, a 2-wheeled cart similar to a wheelbarrow can be equipped for the same purpose.

Because complaints from machine operators or others on specific lubrication problems come up when oiling personnel are in out-of-the-way locations in the plant, or members of the night shift report lubrication difficulties over night, some specific instructions to oilers do have to be made every day. Troubles can then be handled most efficiently with a minimum of interference in the smooth carry-on of the oilers' routine assignments.

Step 6—Periodic instruction and education of oilers and maintenance personnel. Through books, movies, slide films and lubrication clinics, a good lubrication engineer or supervisor can effectively instruct and educate oilers and maintenance personnel in the fundamentals of lubrication and the procedures to be followed in assuring the use of the right oil in the right place in the right way.

This step in a planned program, most lubricant experts agree, cannot be emphasized too much. It is a means of keeping the proper per-

sonnel lubrication-wise and lubrication-conscious. It pays dividends in more co-operation among plant personnel, because the mystery of lubrication is dissolved and a fuller understanding of the importance of correct lubrication is realized. To know what is being done about any specific thing, how it is being done and when it is being done, is to create a healthy climate for getting the most out of any specific effort.

Step 7—Evaluate the benefits. This is done by a periodic study of the lubrication effort throughout the plant. Through a comparison of results with those previously recorded in the original lubrication study, the benefits, improvements and profits from more efficient lubrication can be summed up. A lubrication engineer, with the help of plant personnel, can do this work through written reports on accomplishments, and recommendations for the record as well as the future planning of plant management.

New Books

Power Capacitors, by Ralph E. Marbury, manager, capacitors section, Switch Gear and Control Divisions, Westinghouse Electric Corp.; published by McGraw-Hill Book Co. Inc., New York, for $3.50.

A discussion of the methods to be used to determine the kind and number of capacitors needed to correct a given condition, be that voltage or low power factor or a combination of the two, is contained in the book. This information follows a brief explanation of the materials and characteristics of capacitors, their ratings, and design and manufacture.

The book is the first volume to be published in the Westinghouse-McGraw-Hill Engineering Books for Industry series. Among the subjects covered are capacitor materials and characteristics, application of shunt capacitors to industrial power circuits, fuses, switches, and connections used with shunt capacitors, automatic control of capacitor Kvar and capacity installation and maintenance.

—o—

History of the Tools Division, War Production Board, by Bradley Stoughton; cloth, 154 pages, 6¼ x 9¼ inches; published by McGraw-Hill Book Co. Inc., New York, for $4.00.

Machine tools are essential to the fabrication of almost every type of article. Because of this, their production received early attention from the Army-Navy Munitions Board in preparation for what was later to become the "Arsenal of Democracy'. A group of technical men and administrators, mostly recruited from the machine tool or allied industries, worked to stimulate production of these tools and make the best possible use of those available.

Purpose of the book is to supply an intimate record of the activities of the Tools Division of the War Production Board. The author has given personal notes on the directors, assistant directors, heads of sections and those active in the work of the division. Some 147 photographs of individuals and 16 group photographs are said to include almost every former member of the division. Chapters of the book are as follows: A digest of division history, administration and organization; personnel; pioneer activities; early branches and units; supplies, portables and accessories; abbreviations and orders; and suggestions for betterment in any future emergency. Also included in the book are graphs and organization charts.

—o—

How to Use Kodagraph Reproduction Materials, 72 pages, published by Eastman Kodak Co., Rochester, N. Y., for 50 cents.

Describing photographic techniques for engineering reproduction, this handbook illustrates methods for copying various types of drawings and of restoring or revising old, stained or faded drawings. Also described are recommended procedures for special copying problems, such as reproducing an intermediate from a blueprint or from an original drawing printed on opaque stock.

Materials for use with various types of drafting room printers are described and complete instructions for exposing and processing these materials is given. A reference table lists causes of unsatisfactory prints and remedies for them. Handbook is designed to serve as a reference work for reproduction departments and as a guide for engineers who seek to eliminate handwork in drawing reproductions.

—o—

Proceeding of 35th Annual Convention, American Electroplaters' Society, edited by Gustaf Soderberg; cloth, 312 pages, 6¼ x 9¼-inches; published by American Electroplaters' Society, Jenkintown, Pa., for $5.00.

Contained in this book of the AES convention, held in Atlantic City, N. J., June 27 to July 1, 1948 are 20 papers presented at the meeting. Along with these papers, many of which contain photomicrographs, tables and graphs, is given information on the Electroplating Society, such as active committees, annual meetings and presiding officers, members, paper and exhibit award details and AES branches.

Among the papers presented at the convention and included in this volume are ones on the following subjects: "A Spiral Contractometer for Measuring Stress in Electrodeposits", "Judging the Quality of Plated Parts," "Porosity of Electrodeposited Metals and Measurement of Intrinsic Porosity," "Bright Barrel Plating of Nickel and Zinc," "A Circulating Electrolytic Cell for Strip Plating Evaluation," "The Electroplaters' Metals of the Future" and "Practical Methods of Cost Finding and Estimating on Metal Finishes."

—o—

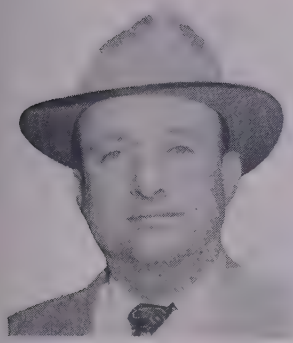
Principles of Magnaflux, by F. B. Doane, president, and C. E. Betz, vice president, Magnaflux Corp.; cloth, 388 pages, 6½ x 9¼ inches; published by Magnaflux Corp., Chicago, for $5.00.

New methods, new materials and new approaches and practices developed in the field of nondestructive testing with Magnaflux have rendered the first and second editions of the book nearly obsolete, according to the authors. This third edition is organized and written to furnish supervisory personnel, inspection heads and the operator with a source of all the information needed for the most effective results from inspection with the process. Subject is covered from the basic electrical and magnetic principles which apply, through the range of methods, materials and equipment which are in use, to the newest and most effective high production equipment.

Emphasis is placed on the fundamentals as they are understood and controlled, for best results from inspection with Magnaflux. This information is clearly presented and includes applications in such particular fields as the railroads, high production industries, oil industry and welding, aircraft, truck and bus overhaul, etc. In all, there are 13 chapters and 170 illustrations. Chapter subjects include magnetism, field distribution, magnetizing current characteristics, the inspection medium, indications of surface and subsurface defects, inspections of welds and large castings and forgings, demagnetizing, and the evaluation of defects.

To Cut Costs... Don't Skimp on Weld-Planning

By Michael Senek, Vice President
Falls Welding & Manufacturing Co., Newton Falls, Ohio



Michael Senek

Starting out as a small job welding shop, we have built a good reputation throughout the Middle West as fabricators of earth-moving equipment parts. Much of our success is due to the extreme care we take in preliminary planning of jobs and in tooling up for close tolerances and high-speed welding. It pays off in lower costs and top quality.

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1. Analyze the design. Suggest design changes to the customer if they will simplify tooling-up or speed up welding, without affecting operation of part.

2. Tool-up for down-hand welding. We design and build our own fixtures to hold parts in accurate fit-up and permit positioning for speedy, down-hand welding with large electrodes.

3. Call in Lincoln Engineer. We find it valuable to have his suggestions on the design, the fixtures and the welding procedure—type and size of electrode and welding current.

Needless to say, we are rabid fans for the Lincoln team—its Engineering Service, Welders and "Fleetweld" Electrodes.

Fig. 1. Finish welding boom for loading machine. Fixture can be rotated to any angle for downhand welding. Uses 400-amp. "Shield-Arc" Welder with ¼" "Fleetweld 5" Electrode at 300 amps.

Fig. 2. Finish welding of hydraulic tank for loading machine in positioning fixture. Many joints are boxed into corners, making arc blow severe. Welded with 500-amp. "Fleetwelder" and 5/16" "Fleetweld 7" at 400 amps.

The above is published by **THE LINCOLN ELECTRIC COMPANY** *in the interests of progress.*
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Spinning Stainless

(*Concluded from Page 92*)

surface to be spun. The production of cylindrical shapes or shells usually requires three steps, namely dishing, cupping and finish shaping.

In the spinning of metal, just as in rolling, the metal is subjected to considerable deformation or reduction in thickness. In the case of a half sphere spun from stainless steel, this reduction may amount to as much as 33⅓ per cent. Therefore, in working out the details of a new spinning job, the supervisory engineer must specify the gage of the metal and the blank size which will result in the required thickness in the finished part and the completion of the part without excess metal. Shape of the spinning has considerable influence on these considerations. Experience is the chief guide of the engineer in making his determinations.

Because of its lower ductility and work hardening characteristics, stainless steel is more difficult to spin than mild steel. For this reason, 10-gage or 9/64-inch, is regarded by Craft as the maximum thickness of stainless sheet for spinning, whereas mild steel can be handled readily up to 7-gage or 3/16-inch.

Stainless steels of the straight chromium types containing 17 per cent chromium or more are not well adapted to spinning. Reductions are less and more annealing is required than with lower alloys. Best results are obtained in spinning when the chromium content ranges between 12 and 16 per cent.

The 18-8 type stainless has high ductility and is therefore well suited to spinning operations. However, because of its rapid work hardening, this steel may require a number of annealing treatments. To reduce this hardening tendency, somewhat higher nickel content—approximately 12 per cent—is employed frequently, permitting about two to three times as much deformation before annealing is necessary.

Annealing Facilities—As annealing of stainless steel, or other metal being spun, becomes necessary, the material is transferred to the annealing department for appropriate treatment. The annealing operation is performed in a specially-built Lindberg gas-fired furnace equipped with Wheelco temperature control. This furnace, shown in Fig. 5, has a hearth area 84 x 84 inches and is capable of producing and maintaining any specified temperature up to 2500° F. The customary temperature employed for stainless steel is 1950°.

A hearth-level transfer car mounted on casters and rolling in channels on a welded steel table in front of the furnace facilitates charging work into the heating chamber and removal therefrom. The spun part is deposited on a heat resisting alloy tray resting on the transfer car. The car is moved in front of the furnace and the tray is pushed onto the hearth. Work remains in the furnace until it is uniformly heated, then withdrawn and allowed to air cool. Cooling is accelerated by a stream of air from a man-cooler type fan.

Prior to annealing, the work must be cleaned thoroughly of any lubricant used in the spinning operations. Furthermore, in the case of stainless steel, the work must also be pickled in nitric acid to remove all traces of copper if brass or copper alloy tools were used in spinning. Otherwise, even the most minute amounts of copper will penetrate the sheet during annealing and will cause cracks during further spinning.

Pickling Operation—Pickling as required is performed in a carbon block lined tank 84 inches square and 30 inches deep, supplied by the National Carbon Co. The tank, shown in Fig. 6, has a hinged cover and hood and an exhauster provides fume removal. The solution is maintained at proper temperature by a steam coil. The operator immerses the work manually and allows it to remain in the bath until a white pickle is obtained.

After the spinning of articles is completed, a pickling treatment is given for the purpose of removing all foreign substances. The clean surface which results is similar to what is known as a No. 2 finish and in some cases meets customer specifications for finish. If higher finish is required, polishing is performed to obtain finishes ranging from No. 4 to No. 7.

Smaller spinnings are polished on two-spindle polishing lathes, the work being held by hand or in a fixture against polishing wheels. For faster polishing, some lathes are equipped with polishing belts and backstands, as shown in Fig. 7. Grade of wheel or belts used determines the degree of polish or finish. For the protection of the operators, dust resulting from the polishing operation is removed by collector. As an adjunct to polishing, some grinding sometimes is done by flexible shaft grinders.

Large spinnings, such as half spheres, are polished on a turntable machine, shown in Fig. 8. The work is bolted or clamped to the table which is rotated at required speeds through a variable-speed drive. While the work is rotating, the operator polishes the surface by a handle-bar equipped belt grinder suspended overhead from a chain block. In some cases a flexible shaft unit is used as the grinding tool. To provide the operator with easy access to all parts of the work, the turntable can be tipped through approximately 45 degrees in two directions.

ON THE LEVEL: Use of this leveler in the Mount Clare shop car yard of the Baltimore & Ohio Railroad, Baltimore, has made possible elimination of ramps, a reduction in labor costs and more efficient use of the small available space. Hand lift trucks and skids, used for the movement of materials between car floor heights and ground level, have been made a one-man operation, the railroad states. The elevating device, built by Service Caster & Truck Corp., Albion, Mich., has a platform measuring 6 feet 6 inches by 8 feet. Capacity is 6000 pounds

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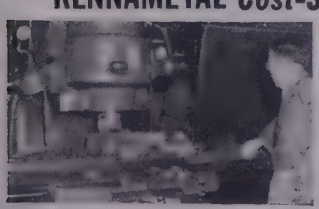
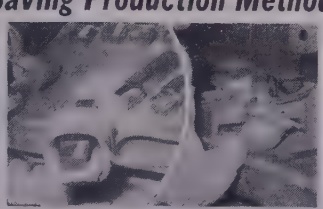


Improved types of milling machines expedite forming and recessing of shanks



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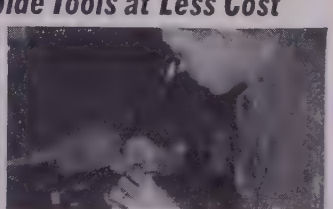

Inspection of every tool insures sound tip, proper braze, true edge

FUNDAMENTALS of STEELMAKING

NUMBER 10 OF SERIES

Another in a continuing series of articles on the making of steel and finishing it into products ready for the consumer. Each article is written by an outstanding authority in his particular field.

Production of TIN PLATE

The author herewith describes the alkaline and the acid processes, both of which are currently used for depositing tin electrolytically on steel sheets to produce tin plate

By ALFRED E. KADELL
Manager, Tin Plate Department
Weirton Steel Co.
Weirton, W. Va.

PART III

TWO principal methods in use at the present time for producing tin plate by electroplating are the alkaline process and the acid process. The alkaline process employs either sodium or potassium stannate as the electrolyte, with the operation being carried out at speeds up to 600 feet per minute. The acid process comprises two types; one employing tin phenol disulphonate as the electrolyte, with operating speeds of around 600 feet per minute, and the second using stannous chloride as the electrolyte, with operating speeds up to 1400 feet per minute. The last named, also known as the halogen process comprises the following operations; Electrolytic cleaning, to remove any oils or other surface contaminants that got on the band in previous operations; scrubbing and washing, pickling, to remove any oxides or other acid soluble contaminants that may be present on the surface of the steel, scrubbing and washing, electroplating, washing, melting tin coating, chemical treatment, washing, and oiling.

The plating line is equipped with two uncoilers at the entry end, in order to avoid having to stop the line when one coil has been run off and a new one is to be started. While the coil in one uncoiler is being processed, another coil is placed in the second uncoiler, and made ready to be rapidly welded to the end of its predecessor. A 70 foot deep pit, immediately after the welder, permits maintaining a loop which acts as a reservoir, containing enough length of band in it, to allow for welding time at slow line speed. A line stop causes that portion of band, lying in the plater at the time, to become stained, resulting in defective plate.

There are also two reels at the exit end, as will be shown later, which permit automatic cutting of the band, and the starting of a new coil on the second reel, without stopping the line, when the coil on the first reel reaches full size.

The two uncoilers are followed by a trip shear and welder. The trip shear is used to square up coil ends before welding. A pair of rubber-covered pinch rolls, located just past the welder, furnishes tension on the band, thereby rotating the uncoiler and unwinding the coil. These rolls feed the band into a looping pit. Upon emerging from this pit, strip enters a drag unit which furnishes the necessary back pull for maintaining a tight band, to guarantee straight travel through succeeding units. This drag unit is of exactly the same design as the one employed in the cleaning line, just ahead of the reel.

Upon coming out of the drag unit, the band breaks over a deflector roll, and enters an electrolytic cleaning tank which is similar in design to, but only half the length of the one employed in the cleaning line. It contains four sets of grids in two electrical groupings, each of which consists of one positive and one negative set of grids connected to a 3000 ampere 16 volt generator. In all other respects, the operation

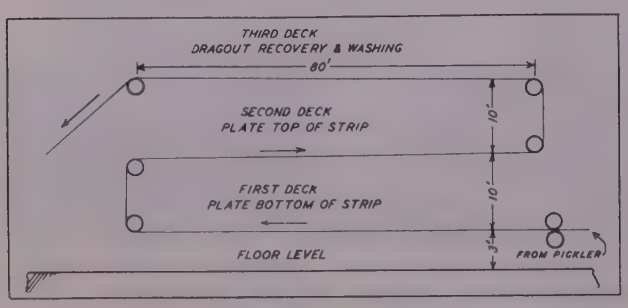

Fig. 11—Schematic elevation view of plater

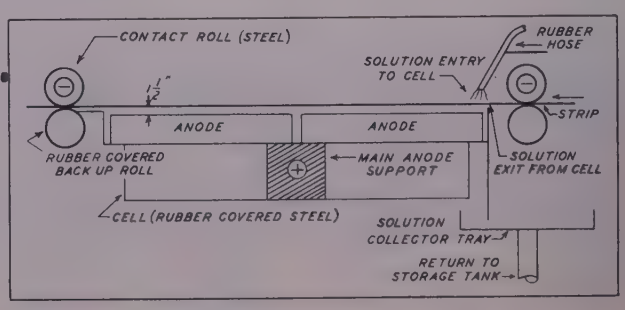

Fig. 12—Layout scheme of plater cells

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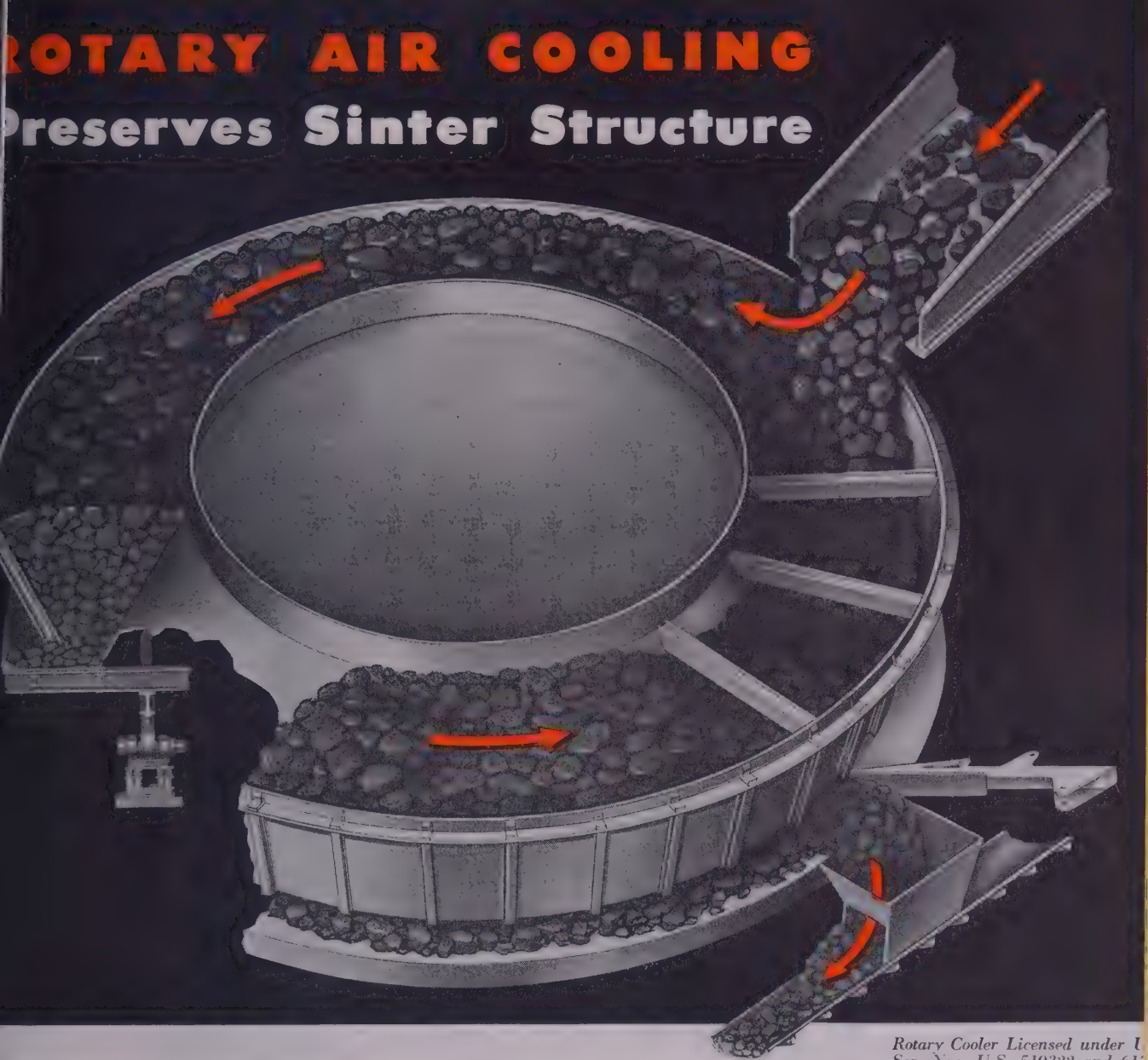

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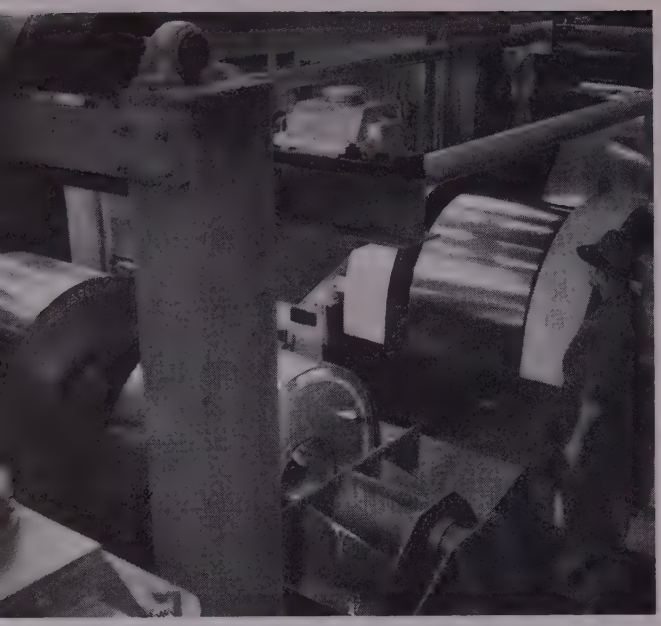


Fig. 13—Entry end of electroplating line, showing band being run off out of No. 1 uncoiler (not visible in picture.) No. 2 uncoiler shown at right near workman is ready with fresh coil whose front end has been taken up to welder in preparation for being welded quickly to tail end of coil in No. 1 uncoiler

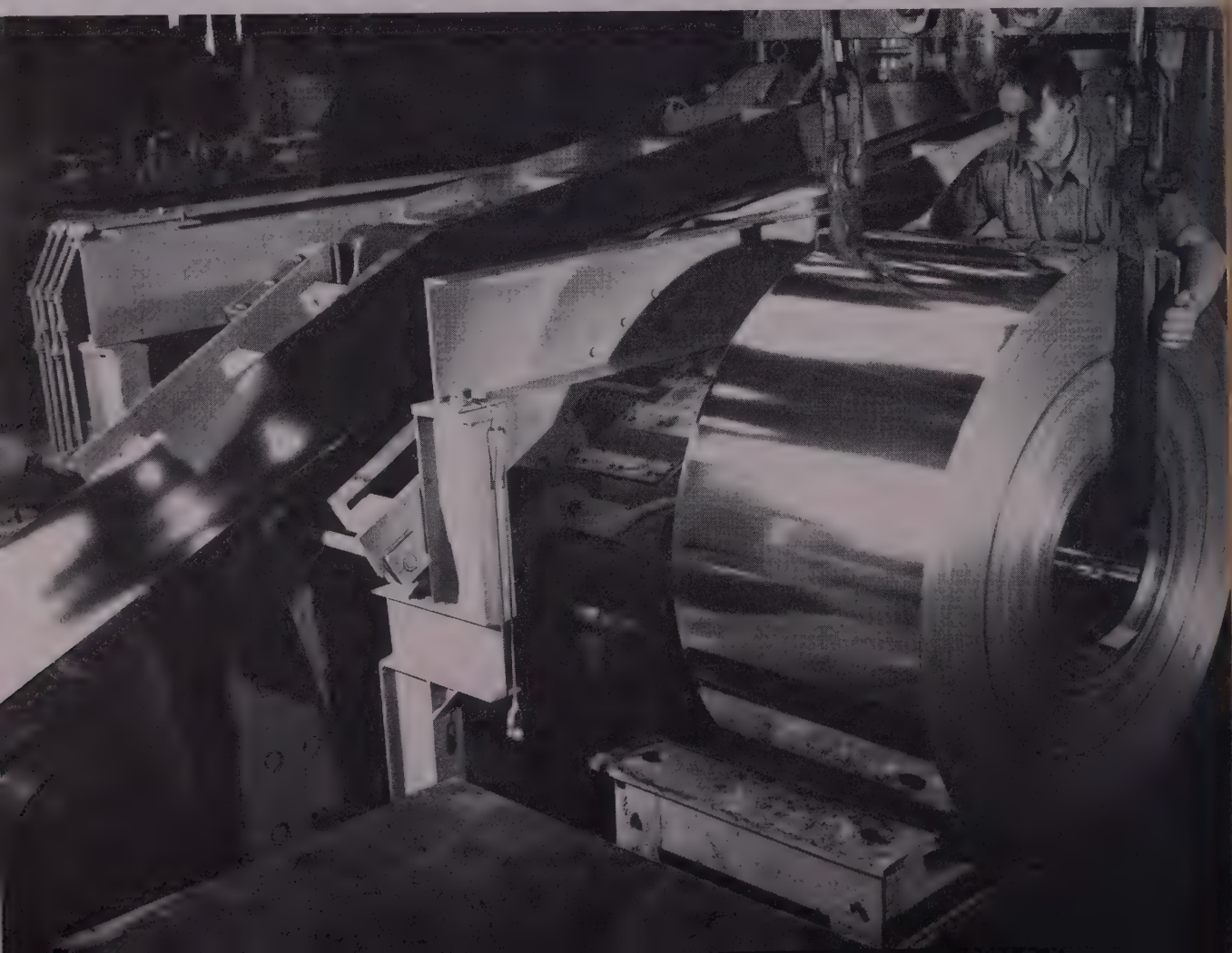
in this electrolytic cleaning tank is exactly the same as that described for the one used in the cleaning line.

As strip emerges from the cleaning tank it enters a pair of rubber-covered wringer rolls where the excess dragout of electrolyte is squeezed off and returned to the tank. From the wringer rolls, the band goes into a scrubbing and washing unit where 12-inch diameter brushes, rotating at about 3000 revolutions per minute, scrub both sides of the band simultaneously, with the aid of high pressure water sprays. The strip then enters a pickling tank which is lined on the inside with a layer of rubber, and a row of acid-resistant brick. This tank is 65 feet long, 3 feet deep and 4 feet wide. At each end of it, there is a 24-inch diameter rubber-covered dunking roll, under which the band passes and is thereby kept submerged in the acid. The pickling solution is maintained at about 8 per cent concentration by weight of sulphuric acid, and the temperature is held around 180° F by means of steam jets.

When the band leaves the pickling tank, it passes through a set of wringer rolls, and then enters another scrubbing and washing unit. Further wringing with rubber-covered rolls removes excess wash water, after which the strip passes into the first deck of the plater.

The plater is 80 feet long and, as shown in Fig. 11, consists of three levels or decks. In each of the first two decks, there are 12 plating cells, all in line, thus

Fig. 14—Exit end of electroplating line. Workman is "hooking-up" finished coil to be removed by crane



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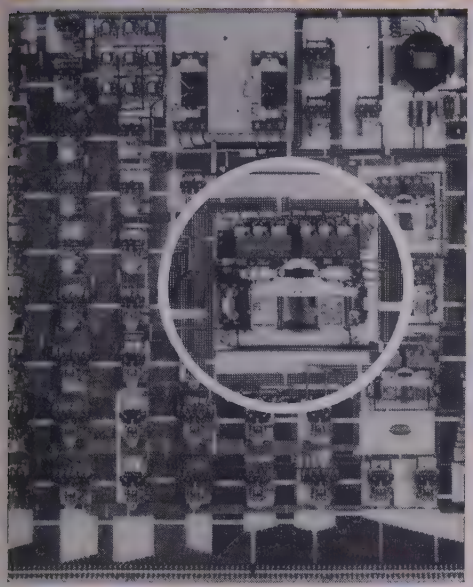

BEAUTY BY THE MILE

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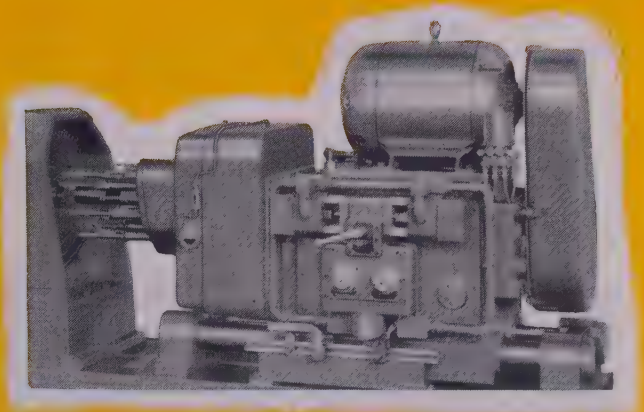

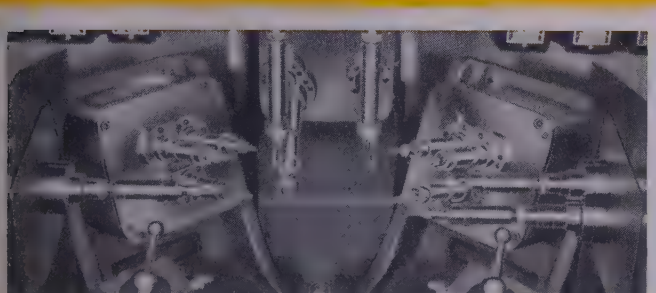

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making a total of 24 cells in the entire plater. Each cell is 6 feet long, 5 feet wide and 1 foot deep, and is connected to a 5000 ampere-12 volt generator. Between the cells, and at the entry end and exit end of each of the two plating decks, there is a pair of 8-inch diameter rolls between which the band passes. The bottom roll is rubber covered, and, by spring pressure at its ends, bears up against the top roll thus effecting tight contact between them. The top roll, called the cathode roll, is made of steel, and has a copper commutator with carbon brushes at each end. It takes the current off the strip, and is connected to the negative side of the generator. There are, therefore, 13 of these pairs of rolls in each of the two plating decks, and they are all motor driven in synchronism with the main drives.

Fig. 12 shows a cross-sectional view of a cell. The main anode support, located in the center, is a solid tin casting, and is connected to the positive side of the generator. It extends across the full cell width. Anodes are solid tin, each 30 inches long and 3 x 3 inches in cross section. One end of the anode rests on the main anode support, while the other rests on an auxiliary, nonconducting support located in the end of the cell. Thus, all anodes are placed in the cells with their long dimension in the direction of band travel. There are two beds of anodes in each cell, each of which is composed of about 15 anodes lying in close proximity to each other across the cell width. Each bed is kept level, and the top of it is about 1½ inches below the band passing over it.

The electrolyte, which is principally stannous chloride as mentioned previously, is continuously pumped into each cell from a 15,000 gallon storage tank located under the plater. The solution level is maintained up against the bottom of the band by sealing the exit end of the cell, and permitting overflow only at the entry end, at which point a clearance of only about ⅛-inch between cell and band is allowed. Overflow from each cell returns by gravity to the storage tank by way of return lines. Current, up to 5000 amperes maximum per cell, thus passes from the anode support into the anodes, which form the positive pole of the cell, then through the electrolyte to the band, which is the negative pole. It, therefore, now becomes evident that tin is plated on the bottom side of the band in each deck.

Since, for obvious reasons, a plating line must be operated at various speeds, plater generators are so governed electrically, that for a given coating weight to be plated, current furnished by them to the cells changes automatically with the line speed, so that a uniform coating of tin is applied at all speeds. In addition, a master control compensates for variation of internal resistance in individual cells. If the current from one cell falls off, the other generators pick up the load until the excessive resistance in that cell is cut out by the plater operator.

As shown above, the band, in passing through the

Fig. 15—Entry end of plater, showing three decks or levels. Workman is inspecting band as it goes from second deck to the third. Lower right shows wringer rolls at exit end of pickler followed by scrubbing and washing unit

Fig. 16—*Plater cell, with band going through, being plated on bottom side. Bus bars are attached to main anode support in center of cell. Solution is being pumped into cell by way of rubber hose at right. Cathode roll is shown at left with copper collector and brushes at its end to take the plating current away. Large pipe beside workman carries plating solution away from cells in second deck to storage tank located beneath the cell*

bottom deck (see Fig. 11), becomes plated with tin on its bottom side. Upon issuing from the bottom deck, it is deflected 90 degrees clockwise to a vertical direction of travel, and, about 8 feet above this point, it is again deflected 90 degrees clockwise to a horizontal direction of travel into the second deck of the plater. The band is now moving in the opposite direction from that in the first deck. Thus, in going from the first level of the plater into the second, the strip is turned over, so that, what was the top side in the bottom deck, becomes the bottom side in the second deck where it is now electroplated.

At the exit end of the second level, the band, now fully coated on both sides, is again deflected 90 degrees in each of two steps, the same as at the exit end of the first deck, but this time it is done counterclockwise, so that, upon entering the third level, the band is travelling in the original direction. While passing through the third deck, the excess dragout of electrolyte is recovered from the band, and is run back to the storage tank under the plater. The remaining electrolyte is then thoroughly washed and wrung off the band, when it passes through a series of three sets of wringer rolls and water sprays.

From the exit end of the top level, the band comes down an incline into a tank on floor level, where it is given a hot water dip. It is then dried thoroughly, as it travels past a series of hot air blasts, and enters the tension unit. Although of exactly the same mechanical design as the drag unit, which pulls against it, the tension unit is driven, and pulls the band through the plater, pickler and cleaner.

The strip now enters another pit that supplies the

Fig. 17—*Exit end of plater, showing the three levels with washing and wringing arrangement on top deck. Note band coming down incline from top level into hot rinse tank and then through hot air blast drier. Tension unit, in lower left, pulls band through plater, pickler and cleaner—then feeds it into pit at extreme lower left*

slack ahead of a drag unit, from which the band goes to a roll at the top of a steel tower 20 feet in height. A high frequency inductive field is created inside this tower by a series of rectangular coils made of ½-inch water-cooled copper tubing. The tin coating on the band is melted, or reflowed, by the heat generated in the strip as it comes down through the coils in this tower. The frequency is 200,000 cycles at 17,000 volts, and the power input is electronically controlled so that the tin is heated to only slightly above its melting point, thereby avoiding any burning or oxidizing of it. The band then enters a tank of water at the bottom of the tower, where the strip is quenched, thereby setting the tin coating.

Coming out of the plater, the tin coating has a matte finish. That is, it is dull and lustreless in appearance. In this state, it is soft and very susceptible to marring by mechanical handling. Reflowing or melting the tin produces a bright lustrous coating which withstands handling and fabrication much better, has higher corrosion resistance, and solders more readily than the matte finish.

The band now enters a chemical treatment tank where it is subjected to an electrolytic action which improves the adhesion of organic coatings applied to the tin plate by the can manufacturer. In this process, strip is made the cathode in an alkaline chromate solution at current densities of from 10 to 40 amperes per square foot. The strip then passes through a series of sprays and wringer rolls where it is washed completely free of all alkaline salts, and thoroughly dried. It is then subjected to an electrostatic oiling.

Air is blown through a body of cottonseed oil to produce an oil-air fog that is introduced into a vertical chamber, down through which the strip passes between two grids spaced about 6 inches apart. Each grid consists of a steel frame 40 x 60 inches, made of ½-inch diameter steel rod, with fine wires, about 2 inches apart, stretched horizontally across it. These two grids are connected to a 50,000 volt power pack. Application of this high voltage produces a corona effect at the wires. As the oil fog passes between the highly charged wires in the grids, the fine particles of oil assume a static charge of electricity, and are attracted to both sides of the passing band which is of opposite polarity. Amount of oil deposited on the band is controlled by the density of fog introduced into the chamber. This is done by controlling the air flow used to create the oil fog. The coating of cottonseed oil thus applied is extremely light, around 0.25 grams per base box. Its function is to help the sheets slide over each other more readily during fabrication. It also has some beneficial effect in lithographing.

After the oiling operation, strip passes on to the reel, where it is again wound into a coil, which is then sent to a cutting line to be sheared to the customer's specified dimensions. As mentioned earlier, in order to avoid stopping the line when a coil has been wound up to the desired size or weight, two reels are used, so that, when it becomes necessary to start a new coil, the band is automatically cut by a trip shear, and deflected to the waiting vacant reel.

In the alkaline process, and in the acid process employing tin phenol disulphonate as the electrolyte, plating is done vertically. The plater consists of a large deep tank with a series of rolls just above its bottom, and another row of rolls above its open top. Strip winds through this tank, over the top rolls and under the bottom rolls, thus forming a series of loops, every other one being inverted. Anodes are hung between the vertical sides of these loops, thereby permitting simultaneous plating of both sides of the band. In a number of installations of these types of lines, no reels are employed, plate going directly into a cutting line located immediately following the plating line. The operating speeds of these two types of plating

Fig. 18—Cutting lines, showing uncoiler at extreme left with band forming a loop before entering side trimmer and again before entering roller leveller. Synchronous rotating shear is located immediately after leveller. In cutting line at extreme top, reject gate, which is operated by hole detector and gager, can be seen in the conveyor to the right of the shear, also reject conveyor directly beneath prime conveyor

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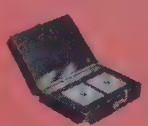

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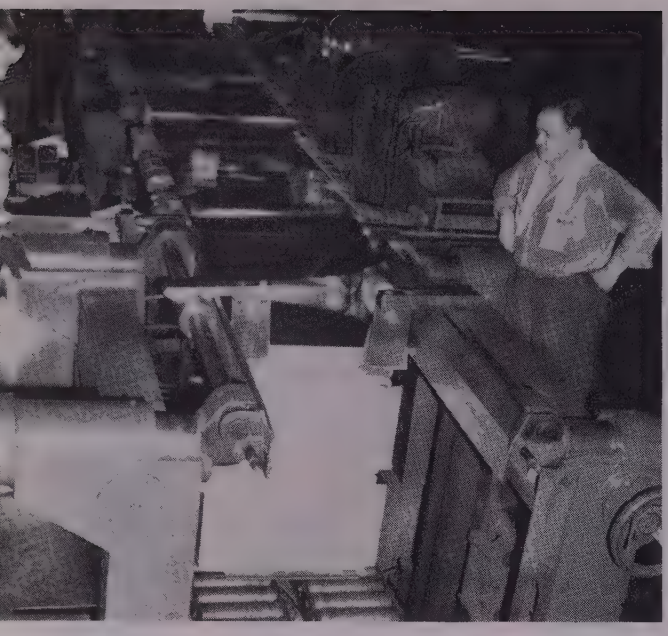


Fig. 19—Cutting line, showing prime piling box at end of conveyor. Note two completed bundles and a third one in process of being piled. Operator at left gradually lowers lift as plate piles up. Extreme top center shows photo electric cell of sheet counter

lines, being about the same as for cutting lines, makes this possible.

Cutting lines used to shear electrolytic tin plate are of the same design as those described earlier for use with the hot dip coating process, minus the side trimmer. However, the assorting or inspection of electroplated tin plate is done at the cutting lines, by trained women, while the coils are sheared. As the coil unwinds, one inspector watches the top side of the band, while the second one sees the reflection of the bottom side of the strip in a mirror. When defective plate appears, the inspector presses a button which opens a gate in the conveyor, and the sheets in question are directed into a designated piling box, called a reject box. Satisfactory plate passes on to a prime piling box at the end of the conveyor, and sheets are automatically counted before dropping into it. When the required number of sheets have been piled up on a wooden pallet, which had been placed in the piling box at the start of shearing, the lift is lowered, another pallet is put into place, and shearing and piling of a new bundle proceeds. Completed lifts of plate are removed by truck to the packaging floor, where they are prepared for storing and shipping in exactly the same manner as in the hot dip process. The same procedure is followed out with electroplated tin plate, in regard to the number of sheets and packages in the bundle, as is done with hot dipped plate.

Piles of plate, that had been diverted by inspectors to the reject box, are placed on tables and hand inspected. Satisfactory plate is packaged and applied to the specific order against which it was produced. Waste waste is handled in exactly the same manner as in the hot dip process. Menders, sheets that have coating defects, are re-run on a hot dip tin pot and then sent to the assorting department for inspection.

Occasional Solvent Use Requires Safety Practice

Jobs involving the occasional use of volatile solvents require rigorous safety precautions as do continuous operations, if the occasional nature requires the use of substantial quantities or use over lengthy periods of time. This was demonstrated by the Safety Research Institute Inc. in connection with the removal of grease from a conveyor belt. Brushes dipped in solvent in open buckets were used for the purpose and the men doing the job had to bend forward to reach across the belt.

In the operation the men brought their faces close to the surface being cleaned. This procedure, in this particular plant, had been followed many times, on the average of once every 3 or 4 weeks, without apparent difficulty. About 10 or 12 gallons of solvent were handled in a period of 3 hours in the operation.

After one such session, when three of the men did the work, two of the men became ill, one recovering in about six weeks and the other dying as the result of injury to the kidneys from the inhaled solvent vapor. According to the institute, when operations are carried out intermittently, the effects of improper handling may not become evident immediately. If it is impractical to provide mechanical ventilation for intermittent operations, workers should be protected from inhalation of the vapors by respirators approved for the type of solvent and circumstances involved, it is stated. Skin contact may be prevented by the use of solvet-resistant gloves, protective creams and aprons.

Toxic Eye Hazard Manual Published

Various safeguards against the many chemicals now used in industrial processes are dealt with in a new manual on toxic eye hazards, published by National Society for the Prevention of Blindness, New York. The result of research undertaken by the joint committee on industrial ophthamology of the American Medical Association and the American Academy of Ophthalmology and Otolaryngology on the effects of various chemicals on the eyes, it contains recommendations based on actual studies of conditions in a chemical manufacturing center.

Type of protective equipment best suited to specific hazards and a standard program for eye safety from chemical exposure are covered in the sections of the book contributed by experts in the fields of industrial ophthalmology and safety engineering. A feature of the 102-page manual is tables of toxic chemicals and their effects on the eyes, classified under organic and inorganic compounds, detergents and soaps. Many charts, illustrations and references are included.

—o—

The fact that expenses connected with selling the government are less than 1 per cent of the business volume—a lower sales overhead than to any trade or consumer outlet—is brought out in a new U. S. Government Procurement Brochure available from Trilane Associates, U. S. Government Procurement Service, 1 Hudson St., New York 13, N. Y. The brochure states in easy-to-follow, easy-to-read language, the short-cuts to successful bidding and execution of government contracts.

Modern Soaking Pit— *Continued from Page 96*

imits the need for a re[illegible]erator to only one end, a com[illegible]gement of pits is possible with reduced spacing requirements between rows. Firing is not symmetrical, being from one end only, with flame length varying from the start to the finish of a heat.

Combustion space being at the top, and mixing of the fuel and air of the long-flame burner occurring when streamlined flow is disturbed as the flame splits to filter downward between ingots, as well as the resistance of hot gases to downward convection, result in a tendency for this type of pit to heat ingots hotter at the top than at the bottom.

Top 2-Way-Fired Pits—This type pit (Fig. 3) has its combustion space on top, above the ingots. Burners are provided on each end, however, one being aimed off-center toward one sidewall and the other off-center toward the opposite sidewall. Outlet ports are on the bottom, at both ends.

By the off-center arrangement of firing, circulation of hot gases is set up in the upper portion of the pit, tending strongly toward equalization of horizontal temperature throughout a charge.

During heavy firing, the two flames cover the entire area of the top of the pit, while under reduced firing, toward the end of a heat, the presence of a flame at both ends (though shortened) assures a supply of heat to each end.

Here again, however, most intense heat liberation is at the top of the pit, and the bottom is heated largely by gases from which the tops of the ingots have absorbed a portion of their heat content to reduce their heating effect near the pit bottom.

The entire hearth area is available for ingot placement and, due to firing from both ends and uniformity of circulation, this type of pit is well adapted for large size requirements by lengthening it to the desired degree while retaining a reasonable width. At the same time, due to horizontal overlapping of the two flames, the length may be reduced, if desired, and still retain a good horizontal circulation and temperature equalization where smaller pits are required.

This type of pit is recuperative, with vertical tile elements, vertical gas flues, and multiple series air flues. A recuperator is required at each end.

Vertically-Fired Pits—This type of soaking pit (Fig. 4) generally has been built approximately square, the burner port being located in the center of the bottom, firing vertically toward the center of the cover. Ingots generally are placed in a circular row around the burner port, or along or parallel to the four pit walls. The waste-gas outlet ports are located in the two endwalls, near the bottom. The flame, entering and propagating vertically, is diverted at the top to "mushroom" uniformly toward the bottom. A large space for combustion is in the center of the pit above the burner port and between the ingots. The pit is recuperative, with recuperators of the vertical tile type, with vertical gas flues and multiple horizontal series air flues. Recuperators are at both ends.

Since the flame is centrally located, the horizontal distribution of heat and horizontal equality of temperature are uniform. Heat transfer by radiation from the vertical column of flame is directed horizontally toward the sides of the ingots, rather than toward their tops only. This is also the case with the heat radiated from the hot gases convected downward on their way to the outlet ports. Due, however, to time being required for the flame to propagate, and the fact that the long flame by contact with the cover liberates large quantities of heat there or nearby due to sudden mixing of unburned fuel and air, ingot tops have a tendency to be heated hotter than bottoms.

This type of pit operates most efficiently when built approximately square.

Bottom 2-Way-Fired Pit—This unit is designed with two burners, one firing into each end, somewhat above the bottom. The flame is directed symmetrically and horizontally along a central firing aisle that results from the proper placement of ingots (Fig. 5). This firing aisle provides ample combustion space.

Outlet ports for waste gases are located in the two endwalls near the bottom corners.

The two flames meet at the center of the firing aisle during full firing, each deflecting toward both sides of the pit and then traveling in reversed direction toward the outlet ports. Tendency of the hot gases to rise causes the flame to rise somewhat above its central axis as it emerges from the burner. However, the draft draws it downward again toward the outlet ports at the bottom. Recuperators are required at each end.

This type of pit has a definite tendency to heat ingot bottoms hotter than tops unless the burners are located at some distance from the bottom, usually about 2 feet, to assure balanced supply of heat to all levels of the pit.

As in the case of the vertically-fired pit, horizontal heat radiation to sides of the ingots is uniform and direct, while that from convection of gases is directed in the same manner.

This pit operates best when built relatively long, as compared to its width. With a length of somewhat over 20 feet, it can properly heat 185 tons of large ingots, and additional length probably would improve its performance in some ways rather than otherwise.

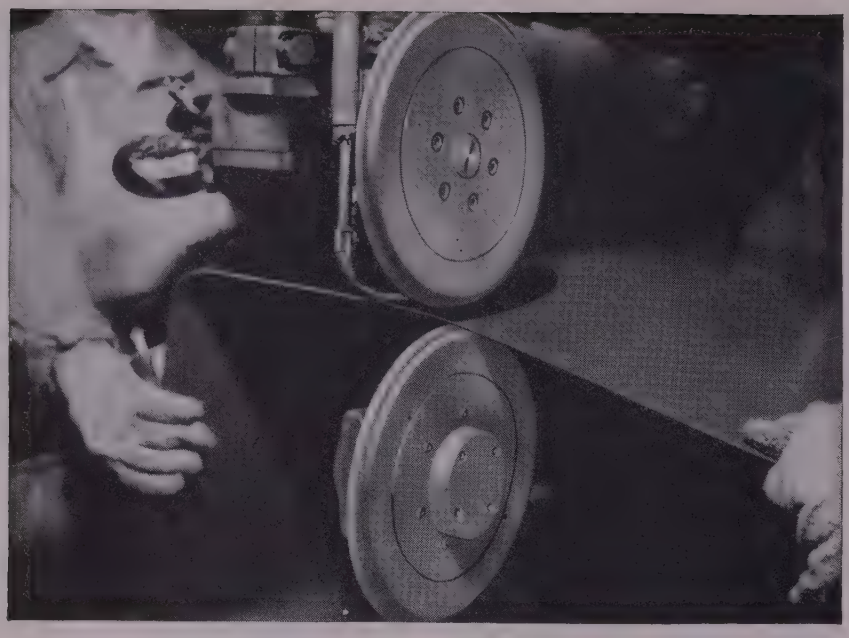
All pits of this type to date have been equipped with horizontal air-tube recuperators. While the pits have given excellent service, they might be improved by use of the more generally employed vertical tile type of recuperator with vertical gas flues and multiple horizontal series air flues.

Tangentially-Fired Pit—This pit is unique in that it is the only one of the modern pits that is neither square nor rectangular in shape and utilizes more than one or two burners (Fig. 6). The pit is circular in shape, surmounted by a dome-shaped cover rather than the usual flat, suspended-brick-lined cover of the other types.

Ingots are placed circumferentially around the central waste-gas port (which exhausts gases vertically downward through the center of the pit bottom) and close to the vertical wall enclosing the upper part of the pit. The lower two-thirds of the pit side is of larger inside diameter than the upper part, to provide an annular alley way or firing aisle between the outer wall and the ingots. This provides an ample combustion space into which the multiple burners, up to 12 in number, fire tangentially. Fuel and air are led to the burners through bustle pipes surrounding the pit. Because of the multiplicity of burners used, each is relatively small as compared to the burners of other types of pits.

Modern soaking pits are all relatively large in area and coverage, the latter term referring to the tonnage that can be accommodated reasonably in a pit at one time. However, certain factors such as average ingot weight definitely influence pit performance.

For example, the top or bottom 2-



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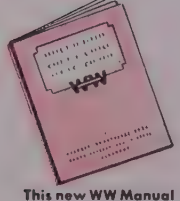

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way-fired pits have been mentioned having best operating characteristi when built relatively long as cor pared to their widths. A high po sible ingot coverage can be expect from a pit of this design. If eith of these types were selected for hea ing relatively small ingots, a lar number of such ingots could be co ered, but the pit would be tied u for unduly long times for chargir and drawing and the "cover-off" p riod (during which the pit cools a considerable degree) would becon unreasonably long. Hence, these pi would not necessarily be the best s lection for heating large numbers small ingots.

On the other hand, where ingots large size are charged, these tw designs are not subject to the for going limitation for, while they ca cover an enormous tonnage, the nun ber of ingots to be charged and draw is not unreasonable.

Because certain types depend f their best efficiency on proper d velopment of a definite flame patter the proportions in design of soakin pits are limited to some extent. F example, the bottom 2-way-fired p should be relatively long as compare to its width. The center-fired an top 1-way-fired types should be pra tically square to attain the unifor horizontal temperature distributio expected of their designs. These tw types are best employed for heatin relatively large numbers of small ingots. This does not imply tha they are not capable of heating larg ingots properly, although only a fe large ingots can be covered in on charge.

Another important consideration to charge pits in such a manner a to take full advantage of the desig and firing principles. Operating cor tingencies may tempt an operator t adopt a compromise pattern of plac ing ingots in a given pit to the detr ment of both quality of heating an pit output.

For example, it may be desire to attain a large coverage of a cer tain sized ingot. The available pit may not be best adapted to thi particular operation. The operato may ignore the basic requirement for the satisfactory operation of th available pits and decide to plac a double row of ingots in the end of a pit not designed to be charge in this manner, as, for example, center-fired pit. Or, perhaps, in th same type of pit, an extra ingo may be charged in each corne Again, in the case of a bottom 2-way fired pit, a double row may be place on either side of the firing aisle In all such attempts, only inferio

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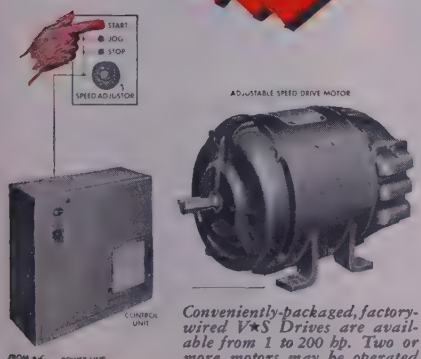

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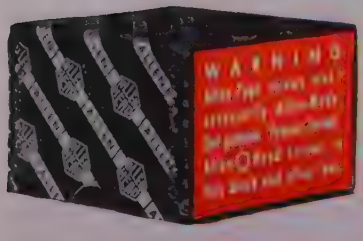

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heating can result. Proper efficienc cannot be obtained by ignoring th basic principles for satisfactory oper ation of any soaking pit.

In the case of the vertically-fire pit where the four additional ingot might be charged in the corner: it is readily evident that these fou ingots, with a corner of each nea the flame and with two faces directl exposed, will be up to temperatur or in distress before any of the othe ingots in the pit. Meanwhile, th ingots in the proper corner location are hidden from direct flame radia tion and heat relatively slowly. Thus there are three different heating con ditions prevailing in such an im properly charged pit: Some of th ingots are subject to proper exposur (those along the sides of the pit) four are unduly exposed, and th corner ingots are shielded to an un desirable degree.

The result of this practice is that instead of all ingots being presente uniformly for heating in the manne for which the pit was intentionall designed, exactly the opposite effec is obtained, and the entire heat mus be retarded to protect the unduly exposed ingots from overheating while awaiting the improbable even of the hidden ingots in the corners coming up to uniform, proper tem perature. Such practices, if attempt ed in an effort to increase output will be found invariably to reduce output.

Another case might be where, to increase coverage and tonnage ca pacity, it would be suggested to lengthen a vertically-fired pit and charge double rows in the ends and single rows along the sides, still en closing a square combustion space as in the original design. This vari ation from the original design of a square pit with a single row of in gots charged along each side nulli fies the advantage of the square, vertically-fired pit. The hidden end rows of ingots that are shielded from direct flame radiation heat slow ly, and the whole heat must be held back to protect the favored single rows from overheating while await ing attainment of the proper tem perature by the shielded rows.

The nature of the hot-working op erations that follow heating is also a factor to consider in selecting soak ing pits. At the one extreme, a pit may be called to serve a heavy rolling mill that makes relatively small total cross-sectional reductions with comparatively little elongation of the ingot to produce a semifinished product that does not have exacting dimensional tolerances. Such pieces subsequently will be reheated for roll ing to a finished product, and due care can be exercised at that time

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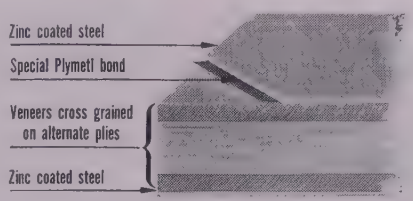
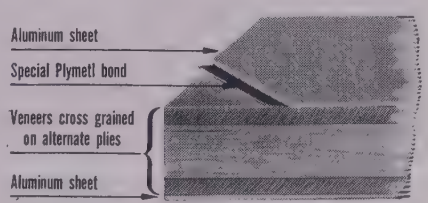
MAKES BETTER PRODUCTS POSSIBLE

Plymetl combines the light weight and rigidity of plywood with the strength of metal. Through 25 years of performance, Plymetl has proved its versatility, durability and dependability. When the War created shortages in supplies of critical metals Plymetl received still greater attention and wider use. Here Plymetl's performance in military equipment proved its worth as a basic structural material. For many applications Plymetl is unsurpassed. Where your product design requires a flat smooth surfaced material of unusual strength and light weight, a material unaffected by moisture and mold and fungi — and rust resistant — SPECIFY PLYMETL. A few of the more widely used types of Plymetl are described and diagramed below.

PLYMETL VE and EVE — A plywood plaque with zinc-coated steel sheet permanently bonded by an exclusive Haskelite method to one (VE) or both faces (EVE). Plymetl panels may be obtained in a range of thicknesses and sizes to suit specific applications. Simple wood-or-metal working tools will fabricate Plymetl.

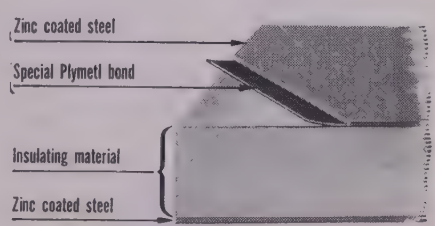


PLYMETL VU and UVU — A plywood plaque with aluminum sheet permanently bonded to one (VU) or both faces (UVU). The great strength and light weight factors of plywood are combined with the light weight of aluminum. Plymetl may be formed to certain curvatures.



PLYMETL ESE — A panel of insulating material with metal sheet permanently bonded to both faces (ESE).

Other types of core materials may be used to make varied kinds of Plymetl. To these cores, metal faces of monel metal, porcelain enamel steel, and stainless steel can be bonded. A core material may be faced with one type of metal on one side and another type on the other side. On all Plymetl panels, the metal faces provide an ideal surface for finishing.



Write for complete data on Plymetl, and bulletin SC45 which gives details on other types of Haskelite materials. Let Plymetl and Haskelite engineers help you design and build products that look better . . . sell better . . . and perform better.

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making furniture of fashion

FOLLANSBEE COLD ROLLED STRIP is a custom-made steel suitable for furniture manufacturing and a myriad other uses. Follansbee Cold Rolled Strip in coils is available in tempers and finishes for most industrial cold rolled steel requirements. Follansbee Cold Rolled Strip and Follansbee Polished Blue Strip are furnished in continuous coils to your specifications. You should be taking advantage of the custom-service on Follansbee Specialty Steels—call the Follansbee Representative nearby.

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SEAMLESS TERNE ROLL ROOFING
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Follansbee Metal Warehouses—Pittsburgh, Pa., Rochester, N. Y., and Fairfield, Conn.

to control heating as related to qu ity of the finished product. Extrem ly high rolling temperatures are ge erally not necessary on mills rollin semifinished products of this typ and the simple dimensional tole ances do not dictate too precise un formity of temperature througho ingots.

On the other hand, ingots of all steels and certain other grades pr sent a widely varying series of pro lems requiring special heating tec niques, both from the standpoint temperature uniformity and hig rolling temperatures.

The initial statement in this di cussion was to the effect that n one type of modern soaking pit invariably the best for all types installations. This fact is now recog nized by designers and builders soaking pits themselves. Originall the furnace guilders tended to pro mote one or another of the model types of pits to the exclusion others. Numerous builders now offe several of the types, radically differ ent from each other in the details out lined above, to meet the specific re quirements of different plants, in stead of concentrating on presenta tion of one favored type.

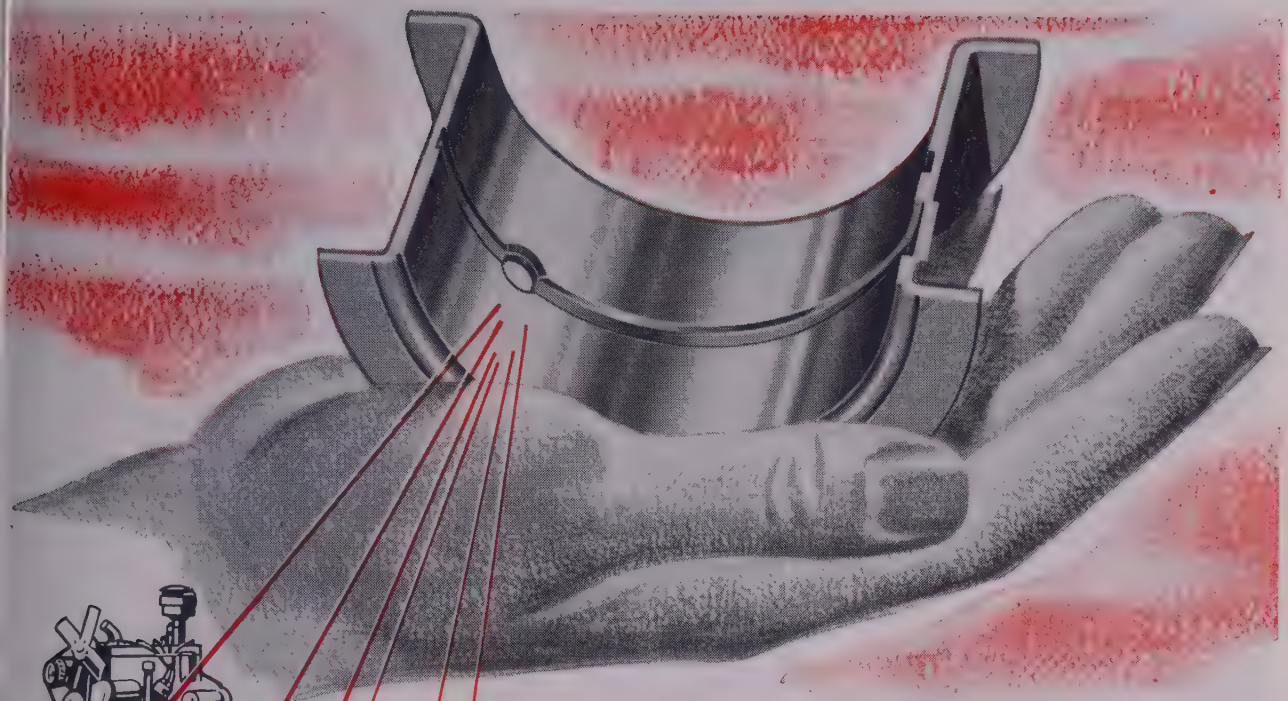
Machine Brazes 300 Bicycle Parts per Hour

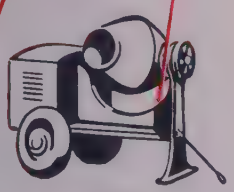
Brazing 300 bicycle fork assem blies per hour is a automatic high temperature, radiant gas-burning ma chine designed by Selas Corp. o America, Philadelphia. The clock wise indexing movement of the spe cial-design rotary hearth passes th work assemblies through six heating stations at 1750° F, for a total heat exposure of 12 seconds, the required time for brazing. The assembly is tripped into position for convenient removal by the operator after the last heating station has been passed

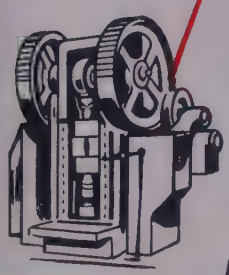
Different bicycle fork lengths may be accommodated by posts support ing the assemblies which may be ad justed during the brazing cycle. The machine consumes 210 cu ft of 1000 Btu natural gas per hour. A com bustion controller supplies premixed gas and air to the burners in a con stant proportion and at invarying pressure.

—o—

Available from University of Illi nois, Urbana, Ill., is engineering ex periment station bulletin series No. 377, flexural fatigue strength of steel beams, by Wilbur M. Wilson, re search professor of structural engi neering. Research was sponsored by American Welding Society and the American Institute of Electrical En gineers.







FINE BEARING QUALITY MEANS *finer performance!*

A precision sleeve bearing looks pretty simple yet it is a complex structure of several metals having at least 27 separate and distinct dimensions.

One type of Federal-Mogul sintered copper-lead main bearing requires 25 separate manufacturing operations, a total of 84 measurement checks and 24 temperature, analysis and special tests.

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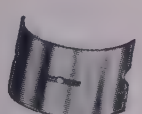
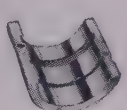


HIGH SPEED, high temperature, automotive type bearings available in many combinations.

SPEED & LOAD bearings for pumps, compressors, industrial electric motors and similar uses.



HEAVY LOAD for big Diesels, power plants, etc.—bearings up to 27½" O.D., steel and bronze back.

BRONZE PARTS in many shapes, sizes; thrust washers, bushings; for many types of applications.

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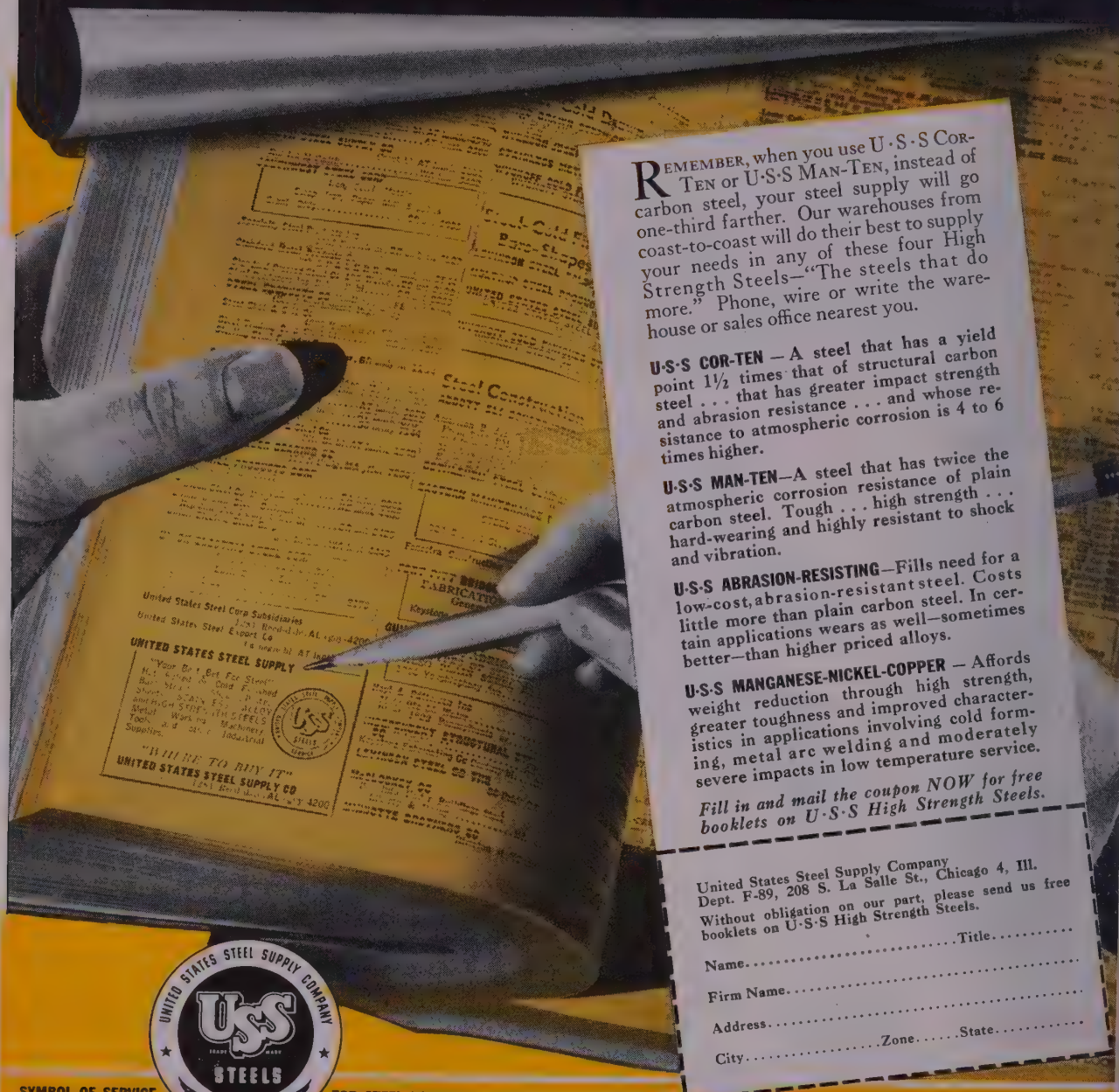

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U·S·S ABRASION-RESISTING—Fills need for a low-cost, abrasion-resistant steel. Costs little more than plain carbon steel. In certain applications wears as well—sometimes better—than higher priced alloys.

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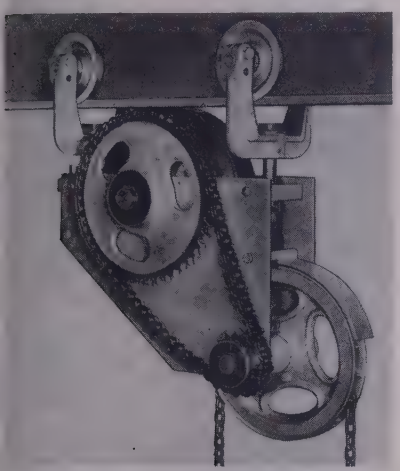
UNITED STATES STEEL

Monorail Hand Drive

American MonoRail Co., 13190 Athens Ave., Cleveland 7, O., is producing a compact drive unit for propelling monorail carriers along overhead track. It operates through a hand chain and sprocket arrangement. Loads up to track capacity can be moved along the track at the



rate of 1 foot per each 28½ inches overhaul of the hand chain.

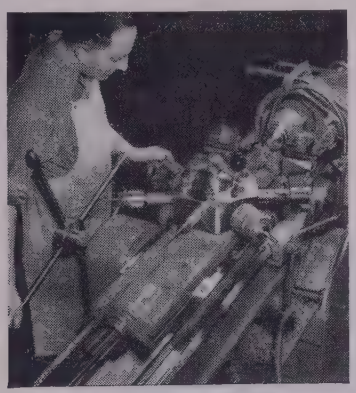
Normal movement of a 1-ton load on a monorail carrier is easily made with a 10-pound pull at the rate of 100 fpm. It is for use where electric power operation is inaccessible and where tractor movement of a monorail load is advisable due to high elevation of track, precision spotting of load or excessive weight. Traction, independent of weight, is obtained by contact of the rubber drive wheel against the bottom of the monorail track.

Check No. 1 on Reply Card for more Details

Turret Lathe

A turret locking mechanism which will index the turret head within plus or minus 0.0005-inch measured 4 inches from the turret face is incorporated in the No. 2-H precision turret lathe, production of which is being resumed by South Bend Lathe Works, 390 E. Madison St., South Bend 22, Ind. Designed for production of duplicate parts, it can be equipped with universal or independent chuck for machining castings, forgings, etc., or can be equipped with Handlever draw-in collet attachment for machining bar stock or tubing.

Maximum swing over bed is 16¼ inches, over cross slide 6⅞ inches. Maximum collet capacity is 1 inch round and hole through spindle is 1⅜ inches. Carriage has friction clutch drive for 48 power cross-feeds ranging from 0.0006 to 0.0312-inch and 48 power longitudinal feeds

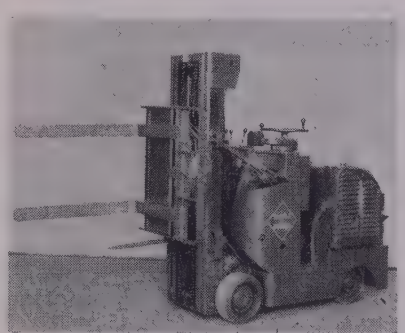


ranging from 0.0015 to 0.0841-inch. Also incorporated are lead screw and split nut for cutting 48 pitches of screw threads ranging from 4 to 224 per inch. Twelve spindle speeds range from 16 to 880 rpm.

Check No. 2 on Reply Card for more Details

Fork Truck Attachment

Upending and transporting of heavily loaded steel barrels is possible with a three-prong fork used with a rotating head on a lift-truck lifting mechanism, made by Elwell-Parker Electric Co., Cleveland, O., as standard auxiliary equipment for



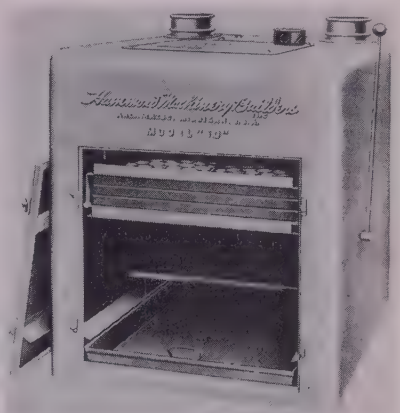
its trucks. When a barrel is standing upright, the short single fork is pushed under it and the truck's upright column is tilted backward slightly. The rotating head inclines the barrel against the long, double fork, in which position it is transported. When the barrel thus carried is to be put down horizontally, the rotating head revolves the double fork with its load to the lower horizontal position and the tines are then withdrawn.

The operation, controlled entirely by the truck driver, is reversed when the position of the object is to be changed from horizontal to vertical. Loads may be stacked to a fork height of 112 inches.

Check No. 3 on Reply Card for more Details

Dust Collectors

Each of three redesigned Duskolectors, made by Hammond Machinery Builders, Kalamazoo 54F, Mich., covers a reasonably wide range of ap-



plications so it can be used with any of a number of different grinding machines. Installation requires only piping to grinder with flexible metal tubing or metal pipe and one electrical connection. Starter may be connected to main grinder switch or operated by separate button.

Motor and blower assembly are easily accessible and can be raised by lifting a single plate which places the motor within reach. Dust laden air is drawn from the grinder wheel hood through the air expansion chamber at the bottom of the cabinet. Heavier particles drop into the dust pan while the balance of the air is drawn through a set of three fiber glass filters to remove finer particles. Filters are of the throw away type and can be cleaned several times by shaking before replacement. As air is dropped from grinder and recirculated in the room, no heat loss is involved. Models offered have capacities of 330, 700 and 1000 cfm.

Check No. 4 on Reply Card for more Details

Motor Winding Oven

Armatures up to 12 inches in diameter and stators up to 1 hp may be handled with the Moto-Baker portable motor winding oven announced by Miskella Infra-Red Co., E. 71 & Grand Ave., Cleveland 4, O. Weighing 298 pounds and measuring 36 x 40 x 43 inches, the unit can be car-

ried to the job. It is designed to fit over an installed motor and to operate either vertically or horizontally. It may be hung from a crane or hoist.

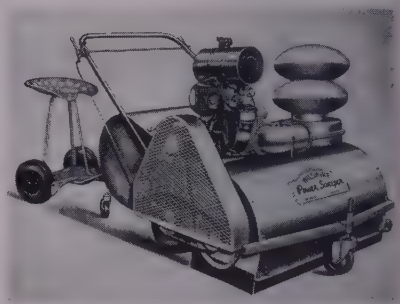
With the use of silicone type insulating varnishes, higher heat is required; this can be secured by substituting a 375 w bulb for standard 250 w bulbs furnished. All the heat rays are directed radially and delivered at an angle to the armature shaft. Penetrating heat rays quickly conduct their energy to the interior of the winding, the copper taking up the heat and holding it in storage, thus permitting the baking to be done from the inside out. Six circuit-breaker switches control the lamped sections.

Check No. 5 on Reply Card for more Details

Power Sweeper

Dust is deposited in a specially designed bag that eliminates the necessity for frequent emptying in the model 500 heavy-duty power sweeper announced by Wilshire Power Sweeper Co., 4615 Alger St., Los Angeles 26, Calif. Sweeper operates throug a blower and filtering system, mak ing possible safe use indoors. Moto is equipped with safety devices fo indoor operation and a special guid wheel enables sweeping up to ma chinery and walls without scrapin, or marring.

It collects waste and sweep grounds or floors in one operatior Sufficient power is furnished to kee floors free of nails, chips and shav ings, yet the brush assembly i



mounted on a full floating ball bearing equipped shaft and enables it tc efficiently pick up dirt, paper anc other types of debris from drives or runways. A finger-tip controlled 3 hp air-cooled 4-cycle gasoline engine furnishes the power.

Check No. 6 on Reply Card for more Details

Palletless Handling Forks

Bales, large crates and pigs may be handled without skids or pallets with a special attachment Worksaver hand truck, the Bunnyhugger,

made by Yale & Towne Mfg. Co., Philadelphia, Pa. To pick up loads, the unit is maneuvered so that the load is between the forks. The operator then manipulates a control lever which causes the forks to grasp the load in a pincher-like movement. Forks are then lifted and the load transported or tiered as desired.

The tilting fork Worksaver on which the attachment is installed has a capacity of 3750 pounds, travels at 2 mph under full load and the

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mast tilts to a full 21 degrees in 10 seconds to center the load. Truck dimensions, without forks, are 35 x 67¾ inches. Overall mast height is 83 inches and fork elevation 56½ inches.

Check No. 7 on Reply Card for more Details

Pallet Racks

Available either with or without the wood pallets are Thrifty racks, manufactured by Borne Co., Sixteenth and Kellogg Sts., Covington, Ky. These racks can be made for pallets in any size up to 60 inches

square and the racks themselves will allow for clearances up to 60 inches. Capacity of one pair of brackets is approximately 3000 pounds.

When not in use, units can be folded nearly flat for storing or returning empty to the original shipper. They are available to fit presently used wood pallets or furnished complete as shown. Pallet size, stringer length and clearance required between pallets is necessary to order.

Check No. 8 on Reply Card for more Details

Turret Tool Holder

Offered by O. K. Rubber Welding Mfg. Co., P. O. Box 246, Littleton, Colo., is the French turret tool holder for engine lathes which indexes 120 positions of 3 degrees each. Easy to install and operate, the tool post holds four tools and may be used for carbide tooling. Turret sizes vary from 2¾ inches square to 7 inches square for installation on 9 to 12 to 22 to 30-inch lathes. Tool sizes

ELIMINATE TROUBLE *BEFORE* IT OCCURS

After a part is made, heat treating may involve some unexpected problems. Extra steps, extra processes, extra time and extra expense combine to produce extra headaches. It is much cheaper to consult with a heat treater beforehand than to blame him later. The best way to eliminate trouble is to get rid of it before it happens. Call in an expert heat treater — naturally, a member of the METAL TREATING INSTITUTE—when the die or part or design is *still on paper*. By consulting with him beforehand, you will *eliminate trouble before it occurs*. Members of the MTI are skilled and experienced; their advice will save you time and money—and moreover, they will do the job *right*. Aside from the fact that members of the MTI like to make money, they also like their work. As professional master craftsmen, they take pride in every job they do—and that's almost as good a guarantee as you can get. When you place a heat treating job, be sure that you place it in the hands of a MTI member; and if the part is still in the planning stage, by all means consult with him in advance.

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METAL TREATING INSTITUTE

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420 LEXINGTON AVENUE, NEW YORK 17, N. Y.

accommodated by the six models range from ¼ to ⅜ inch square to 1 to 1½ inches square. Other sizes may be built to order.

Check No. 9 on Reply Card for more Details

AC Arc Welder

Designed for use on either 110 or 220 v lines, the model 170 portable alternating current arc welder, made by Birdsell Mfg. Co. Inc., 500 San Antonio Rd., Los Altos, Calif., has a welding range from 15 to 170 amp. The unload voltage of 43 v is below

the safety requirements. Electrodes 1/16, 3/32, 1/8 and 5/32-inch in diameter may be used with the machine which has stepless control of amperage within its range.

Two or more machines may be coupled together for very heavy welding. Heavy mica insulation is added to every point where special protection is needed. All coils are impregnated with insulating varnish and baked. Welding may be in flat, vertical, overhead and in corners.

Check No. 10 on Reply Card for more Details

Drum Sander

Cost of buffing, polishing and grinding can be reduced through the use of the Cone-Loc drum sander and ordinary strips of abrasives, developed by American Diamond Saw Co., 519 N. W. Park Ave., Portland 9,

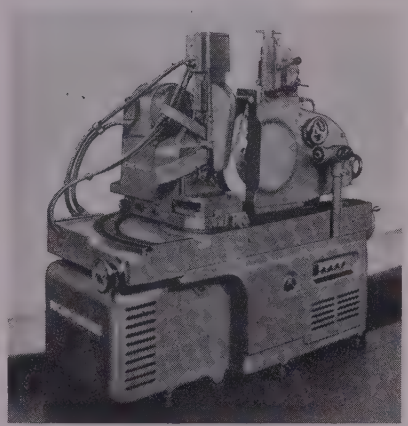
Oreg. Sander is a balanced aluminum split drum, cushioned with rubber, the halves of the drum being locked into a solid drum by a cone type washer.

Standard width abrasives, available in roll form, are wrapped around the drum and secured into place by pins that recede out of the way when the cone washer is tightened down. During buffing, polishing or grinding operations the wheel does not lose diameter and does not need dressing. Abrasive cloth in various grits can be quickly interchanged on the same drum to accommodate rough or fine work. Sander is offered in sizes from 6¼ to 12 inches in diameter and in various widths and bores. A 6¼-inch felt cushioned sander is also available.

Check No. 11 on Reply Card for more Details

Grinding Machines

Employing a new principle of work support and rotation, the Micro-Centric high production grinding machine, developed by Cincinnati Grinders Inc., Cincinnati 9, O., will, with-



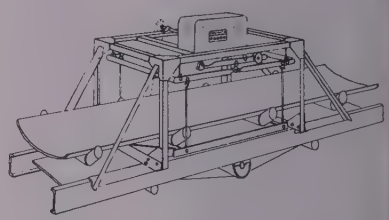
out centers or chucks, easily hold roundness under 0.000025 - inch. Ground diameter can also be held square with a prefinished face with the same degree of accuracy. No. 1 grinder will grind work with the diameter from ¾ to 3½ inches by either automatic or hand loading, while No. 2 machine will handle pieces from 2 to 4 inches in diameter or automatic loading or 2 to 8 inches in diameter with hand loading.

Fundamentally the grinders are built to handle work that has a large diameter in relation to the length, such as is encountered in bearing races. In operation, the grinding wheel head, pivoting on a trunnion under the wheel spindle, is rocked forward into the grinding position through a definite preset cycle, which develops in four phases—load, rapid advance, feed and dwell, retraction and unload. Approximate wheelhead setting in forward position is accomplished by adjusting a locked cam. Depending on the material to be ground and quality of finish required, the combined infeed and tarr time can be varied. Grinders are pr marily infeed machines, with no pr vision made for traverse grindin However, a grinding wheel recipr cater is available for improving qua ity of finish where required.

Check No. 12 on Reply Card for more Detai

Belt Conveyor Scale

Announced by Sintering Machir ery Corp., 70 Pine St., New Yor N. Y., is a unit type belt conveyo scale which is assembled and shippe as a complete unit, requiring les than 12 bolts for installation. Thi Transportometer, as it is called, ma be installed on any existing horizon



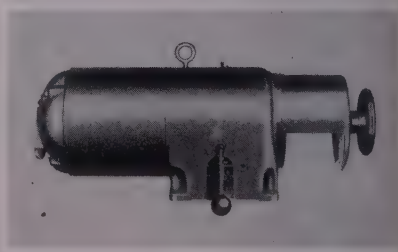
tal, inclined or declined belt conveyo of any width or speed, to automat ically and continuously weigh, indi cate and totalize the tonnage at an rate up to 2000 tons per hour.

They are available for automatic ally regulating preceding feeder con veyors, rotary valves, etc., and ca be provided with remote mounte chart recorders, tonnage indicators duplicate totalizers and predeter mined batch counters.

Check No. 13 on Reply Card for more Detail

Gearshift Drives

Introduced by Lima Electric Mo tor Co., Lima, O., is the type R self-contained multispeed gearshift drive, combining an integrally mount ed motor and a four-speed transmis-



sion. It is designed to individually motorize machine tools formerly driven from lineshaft, but is also adaptable to many types of production equipment requiring selective speeds. The drive features unit-cast gearbox, heat-treated helical gears cut from steel forgings, precision-type bearings, and oil reservoir of ample capacity that is equipped

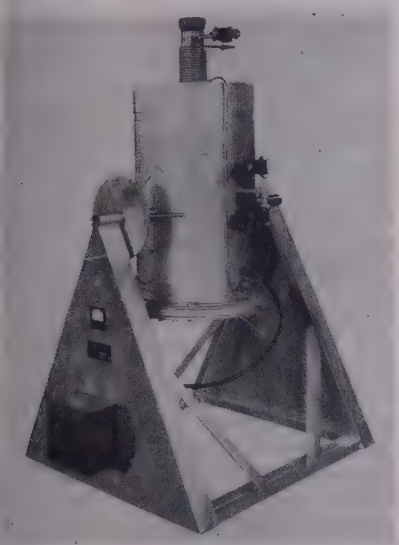
with a magnetic drain plug.

Full rated horsepower is delivered in every speed. A safety type plastic handwheel is provided for inching the machine spindle, eliminating the necessity of touching the belt for any operation. Drive has the following gear ratios: Low, 4 to 1; second, 2 to 1; third, 1.33 to 1; high 1 to 1. Units are built with four speeds in ratings of 3 hp at 900 rpm to 10 hp at 1800 rpm, with eight speeds in ratings of 1½ hp at 1200/600 rpm to 5 hp at 1800/900 rpm. Use of a motor reversing control makes them instantly reversible at all speeds.

Check No. 14 on Reply Card for more Details

Electric Furnace

Operation up to 3500° F under a neutral or reducing atmosphere, pure enough to sinter chromium without oxidation, may be attained with the model MO-224 molybdenum-vacuum



electric furnace developed by Pereny Equipment Co., 893 Chambers Rd., Columbus 12, O. The recommended average operating temperature is approximately 3300° F with the maximum peak of 3500° F for short cycles. The steel case is designed to maintain a vacuum of 30 inches of mercury.

Furnace can be positioned either horizontally or vertically and is constructed so that the inner, or primary, tube containing the molybdenum element may be removed without disturbing the furnace proper. Working area of the furnace is 2 inches ID by 28 inches long with an 18-inch controlled temperature length. It has one open end with a 10-inch vestibule or sight tube, and can be supplied with both ends open when

Whatever you COMPARE with a Forging ACTUALLY EMPHASIZES the METAL QUALITY OF FORGINGS

Macro-etch through longitudinal cross section of crankshaft shows flow lines or fibre like structure that is common in high quality forgings.

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FOR ALL USERS OF METAL PARTS

Sixty (60) pages of authoritative information on metal quality as developed in forgings formed through the use of closed impression dies. Forging production techniques are described and illustrated; economic advantages of forgings are presented from the viewpoint of top management, design engineers, metallurgists and production executives. Your copy is ready. Fill in and attach coupon below to your business letterhead.

The uniformity of metal quality found in forgings cannot be duplicated! Now is an excellent time to check your product for cost reductions right down the line—explore every possibility to improve performance and appearance, while reducing dead weight of component parts. Double check all parts—particularly those which are subject to the greatest stress and strain. Check machining and finishing time schedules—forgings have been known to speed up production by as much as 250 per cent. Rejects at the point of assembly are costly, a needless waste—forgings offer almost a 100 per cent yield of sound parts because forgings are unusually free of concealed defects. Check to see if some parts may not be combined into integral forgings—an obvious saving in finishing operations. Consult a forging engineer when checking parts—only a forging engineer can inform you fully regarding the many advantages obtainable with forgings.

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Please send 60-page booklet entitled "Metal Quality—How Hot Working Improves Properties of Metal", 1949 Edition.

Name_____

Position_____

Company_____

Address_____

required. A Pyrex or quartz sight lens is provided and may be removed or replaced quickly.

Check No. 15 on Reply Card for more Details

Inert-Gas Welder

Hobart Brothers Co., Troy, O., is introducing the model TIH-200-S alternating current welder for inert gas welding. Equipped with supplementary low heat control, the welder can be used either as an ordinary transformer type welder or with the

special features switched on for inert-gas shielded welding. It is equipped for work that calls for extremely low current values.

Low heat control is accomplished by means of a secondary reactor built in and controlled by the hand wheel located on the side of the case. It can be switched on or off at the operator's desire. When on, it makes possible effective welding current as low as 7 amp.

Check No. 16 on Reply Card for more Details

Band Saw

Blade to frame capacity is 12 inches and guide to table capacity is 7-inches maximum on the 12-inch BW-740 band saw announced by Walker-Turner Division, Kearney & Trecker Corp., Plainfield, N. J. The frame and body are in a three-piece cast iron design for accuracy and freedom from vibration and distortion.

An adjustable cushion tensioner protects the blade from shock. Machine has complete guarding with steel wheel and blade covers. It can be carried from job to job as it weighs 120 pounds without motor. Guides have split-leaf blocks set at 45 degrees to secure maximum support close to work, with low friction loss and long blade life.

Check No. 17 on Reply Card for more Details

HOSE: A twin oxyacetylene hose in which two lengths, one red and the other green, are joined by a thin strip of rubber is announced by B. F. Goodrich Co., Akron, O. Reinforcement consists of one braid of high tensile hawser cord cotton yarn. Designated as Duo-Weld, it is made in 50, 25 and 12½ foot lengths, with the ¼-inch size being stocked.

Check No. 18 on Reply Card for more Details

CUTTING SOLUTION: Elox Corp., Clawson, Mich., is marketing a new cutting solution for use in removing broken tools from machined parts and the cutting of holes in hardened steel.

Check No. 19 on Reply Card for more Details

FLANGE PUNCH TOOLS: A new adjustable set of flange punch tools, designed to punch all four flanges of I-beams and wide flange beams at one pass through, is announced by Beatty Machine & Mfg. Co., Hammond, Ind. Punch carrying unit adjusts horizontally from 8 to 30 inches to accommodate beams of various sizes; punch and die units adjust vertically to meet gage line requirements.

Check No. 20 on Reply Card for more Details

VALVE: An automatic air line drain valve for all compressed air applications is offered by Wilkerson Valve Inc., Denver, Colo. It drains off all water and oil that may have collected in the line, together with dirt, rust flakes, and other abrasive matter.

Check No. 21 on Reply Card for more Details

BORING TOOL: Designated as type 16T, a new type of round-nose tool is announced by Kennametal Inc., Latrobe, Pa., for boring in a trough by plunging and feeding both ways. Tool is available in two sizes: 1-inch wide by 1¼-inches high by 12 inches long and 1-inch wide by 1½-inches high by 12 inches long.

Check No. 22 on Reply Card for more Details

COVERS: Covers for chain couplings of molded or rag-filled phenolic plastic, are announced by Morse Chain Co., Detroit 8, Mich. Two-piece construction with slot head screws permits easy installation after coupling has been installed.

Check No. 23 on Reply Card for more Details

GUSHER PUMP: Known as model US-8110, a new motor driven gusher pump is announced by Ruthman Machinery Co., Cincinnati 2, O. It features a large multiple upper inlet cast into the upper section of the impeller housing and use of an independent flanged vertical tubular housing between motor and impeller housing. It is available with 25, 30 and 40 gallons per minute capacities.

Check No. 24 on Reply Card for more Details

FLAME FAILURE SAFEGUARD: For flame failure protection of commercial and industrial oil burning equipment, Combustion Control Corp., Cambridge 42, Mass., introduces Fireye flame failure safeguard type F18T-2. It provides protection for manually ignited oil burners, air heaters, ovens, kilns, etc. It consists of a phototube and amplifying system housed in a dust-tight aluminum case.

Check No. 25 on Reply Card for more Details

COATING: Industrial Research Division of Brooklyn Varnish Mfg. Co. Inc., Brooklyn 1, N. Y., announces a hammer-effect finish, called Tuf-On Hammer-Namel. It is applied in one coat application and is impervious to marring or abrasion. Available in chrome and colors, finish bakes in 20 minutes at 300° F.

Check No. 26 on Reply Card for more Details

BALLASTS: A new line of stabilized-output ballasts designed for use with photo-chemical lamps is announced by General Electric's Specialty Transformer and Ballast Division, Schenectady 5, N. Y. They are of core-and-coil construction; capacitors are separate units so they may be mounted within the housing.

Check No. 27 on Reply Card for more Details

CONTROL HANDLE: An emergency control handle for CSP transformers making possible temporary emergency operation during overload periods when transformer secondary breakers have tripped and dropped the load, is announced by Westinghouse Electric Corp., Pittsburgh 30, Pa.

Check No. 28 on Reply Card for more Details

DIE HEAD: For improved threading of square, flat and irregularly shaped stock, Geometric Tool Co., New Haven 15, Conn., offers style KDS five-chaser rotary self-opening die head.

Check No. 29 on Reply Card for more Details

FOR MORE INFORMATION
on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Market Summary

SENTIMENT is moderately improved in the steel markets with buying a little more active. New business, however, falls short of outgoing shipments so that mill order backlogs continue to shrink. The more optimistic tone stems from rising consumer interest in inventories, expanding manufacturing as mass vacations end, and a noticeable revival of activity in home appliance, refrigerator and a few other lines that have been on curtailed production for some time past.

LABOR—Uncertainty clouds the long-term outlook for business. The trend over the remainder of the year, most observers think, hinges largely on settlements in the current steel and automotive wage disputes, especially the former which may set the pattern for most other industries. There is a lot of guessing on the likely outcome of the fact-finding hearing in the steel dispute, but with the producers' case still to be completed such guesses mean little. There is no question, however, so long as the wage issue remains unresolved market developments will be influenced by the uncertainties induced by absence of stable labor relations.

OPERATIONS—Steelmaking increased for the third consecutive week, rising one point to 82.5 per cent of capacity, highest since June.

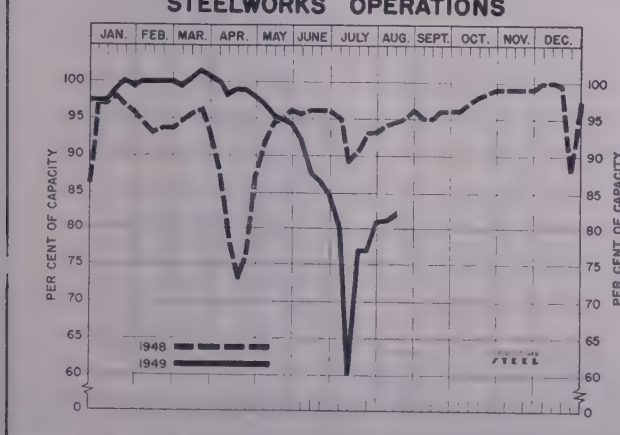
DEMAND—Home appliance manufacturers' demand for sheets, bars and other products has been encouraging of late. Inventory replenishment also has slightly bolstered sagging steelmaking operations. Last week several idle open-hearth and electric furnaces were restored to activity. One large midwestern steelmaker reports current demand two and one half times greater than that early in July. Major business still comes from automotive and related industries and as yet there is no sign of any contemplated curtailment from that direction. It is pointed out, however, in event a steel strike is averted next month it would not be surprising if automotive steel buying contracted since the auto builders have been taking tonnage in excess of actual needs as strike insurance.

PRODUCTS— Cold-rolled and galvanized sheets appear in tightest supply with sellers booked into October. Outlook for the closing quarter is obscure but producers of flat-rolled products expect comfortable order books. Seamless pipe volume is falling below production. Large size pipe order accumulations, however, extend into 1954, and last week merchant pipe demand in some areas was reported brisk. Plate buying is sluggish. Structural shape trade is being bolstered by public work. Hot carbon bar deliveries can be had within three weeks, and cold-drawn bar sellers can give virtually prompt shipment. Tin plate demand from canners is reaching seasonal peak, and bolts and nuts are in slightly better demand with consumers replenishing stocks.

PIG IRON, SCRAP— Movement of pig iron to foundries is gaining following vacation shutdowns. Blast furnace operations, however, continue curtailed with producers piling iron. Scrap shows some signs of returning strength. Prices are firmer, reflecting better trade sentiment. Cast grade prices are tending upward on improved buying by the foundries. Steelmaking grades appear firmer due to better dealer sentiment. Brokers' offers at current price levels are being declined by yard operators.

PRICES— Except for a $10 per ton cut to competitive levels on hand-mill silicon sheets by one producer last week the markets were featureless pricewise. Talk of a general steel price reduction now has faded to a whisper. STEEL's composite price averages are unchanged except for scrap, and compare with the like 1948 week as follows: Finished steel, $91.82 and $95.05; semifinished steel, $62.12 and $75.75; steelmaking pig iron, $45.60 and $43.99; steelmaking scrap, $20.00 and $43.33.

STEELWORKS OPERATIONS



DISTRICT STEEL RATES

Percentage of Ingot Capacity Engaged in Leading Districts

	Week Ended Aug. 13	Change	Same Week 1948	Same Week 1947
Pittsburgh	78	+ 1.5	93.5	98
Chicago	90	+ 1	91	93.5
Eastern Pa.	73.5	— 4.5	91	93
Youngstown	88	+ 8	103	92
Wheeling	92	None	95.5	81.5
Cleveland	98.5	+ 2.5	88.5	96.5
Buffalo	96	None	101.5	88.5
Birmingham	100	None	100	99
New England	58	+ 3	85	90
Cincinnati	91	None	99	87
St. Louis	73	— 2.5	78	84.5
Detroit	100	— 6	102	88
Western	77	— 3	...	...
Estimated national rate	82.5	+ 1	94.5	94

Based on weekly steelmaking capacity of 1,843,516 net tons for 1949; 1,802,476 net tons for 1948; 1,749,928 tons for 1947.

New Summary—P. 59 *Engineering News—P. 89*

COMPOSITE MARKET AVERAGES

Arithmetical Price Composites*

	Aug. 13	Aug. 6	Month Ago July 1949	Year Ago Aug. 1948	5 Years Ago Aug. 1944
Finished Steel	$91.82	$91.82	$91.82	$95.05	$56.73
Semifinished Steel	62.12	62.12	62.37	75.75	36.00
Steelmaking Pig Iron	45.60	45.60	45.60	44.12	23.00
Steelmaking Scrap	20.00	19.34	19.21	43.33	19.17

FINISHED STEEL WEIGHTED COMPOSITE†

June 1949	4.01731c
May 1949	4.01731c
Apr. 1949	4.02031c
June 1948	3.57740c
June 1944	2.46683c

* **STRAIGHT ARITHMETICAL COMPOSITES:** Computed from average industry-wide mill prices on Finished Carbon Steel (hot-rolled sheets, cold-rolled strip, hot-rolled bars, plates, structural shapes, basic wire, standard nails, tin plate, standard and line pipe), on Semifinished Carbon Steel (re-rolling billets and slabs, sheet bars, skelp, and wire rods), on Basic Pig Iron (at eight leading producing points), and on Steelworks Scrap (No. 1 melting grade at Pittsburgh, Chicago and eastern Pennsylvania). Steel arithmetical composites, dollars per net ton; pig iron and scrap, gross ton.

† **FINISHED STEEL WEIGHTED COMPOSITE:** Computed in cents per pound, mill prices, weighted by actual monthly shipments of following products, representing about 82 per cent of steel shipments in the latest month for which statistics are available, as reported by American Iron & Steel Institute: Structural shapes; plates, standard rails; hot and cold-finished carbon bars; black butt weld pipe and tubes; black lap weld pipe and tubes; black electric weld pipe and tubes; black seamless pipe and tubes; drawn wire; nails and staples; tin and terne plate; hot-rolled sheets; cold-rolled sheets; galvanized sheets; hot-rolled strip; and cold-rolled strip. June, 1949, figure is preliminary.

COMPARISON OF PRICES

Representative market figures for current week; average for last month, three months and one year ago. Finished material (except tin plate) and wire rods, cents per lb; semifinished (except wire rods) and coke, dollars per net ton, others dollars per gross ton. Delivered prices represent lowest from mills.

Finished Materials

	Aug. 13, 1949	July, 1949	May, 1949	Aug., 1948
Steel bars, Pittsburgh mills	3.35c	3.35c	3.35c	3.45c
Steel bars, del. Philadelphia	3.8164	3.8164	3.8164	3.79
Steel bars, Chicago mills	3.35	3.35	3.35	3.35
Shapes, Pittsburgh mills	3.25	3.25	3.25	3.275
Shapes, Chicago mills	3.25	3.25	3.25	3.25
Shapes, del. Philadelphia	3.4918	3.4918	3.4918	3.48
Plates, Pittsburgh mills	3.40	3.40	3.40	3.50
Plates, Chicago mills	3.40	3.40	3.40	3.40
Plates, del. Philadelphia	3.5848	3.5848	3.6348	3.71
Sheets, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Sheets, cold-rolled, Pittsburgh	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Pittsburgh	4.40	4.40	4.40	4.40
Sheets, hot-rolled, Gary mills	3.25	3.25	3.25	3.25
Sheets, cold-rolled, Gary mills	4.00	4.00	4.00	4.00
Sheets, No. 10 galv., Gary mills	4.40	4.40	4.40	4.40
Strip, hot-rolled, Pittsburgh mills	3.25	3.25	3.25	3.275
Strip, cold-rolled, Pittsburgh mills	4.275	4.275	4.375	4.375
Bright basic, wire, Pittsburgh	4.15	4.15	4.15	4.325
Wire nails, Pittsburgh mills	5.15	5.15	5.15	5.775
Tin plate, per base box, Pitts. dist.	$7.75†	$7.75†	$7.75†	$6.80

Semifinished

Sheet bars, mill	$67.00*	$67.00*	$67.00*	$67.00*
Slabs, Chicago	52.00	52.00	52.00	52.00
Rerolling billets, Pittsburgh	52.00	52.00	52.00	59.00
Wire rod ⅜ to ¼-inch, Pitts. dist.	3.40c	3.40c	3.775c	3.775c

* Nominal. † 1.50 lb coating.

Pig Iron

	Aug. 13, 1949	July, 1949	May, 1949	Aug., 1948
Bessemer, del. Pittsburgh (N.&S. sides)	$48.08	$48.08	$48.08	$48.08
Basic, Valley	46.00	46.00	46.00	43.00
Basic eastern, del. Philadelphia	49.39	49.39	49.39	46.17
No. 2 fdry., del. Pgh. (N.&S. sides)	47.58	47.58	47.58	47.58
No. 2 fdry., del. Philadelphia	49.89	49.89	49.89	46.67
No. 2 foundry, Chicago	46.50	46.31	46.25	43.25
No. 2 foundry, Valley	46.50	46.50	46.50	43.50
Southern No. 2 Birmingham	39.38	39.38	39.88	43.38
Southern No. 2 del. Cincinnati	45.43	45.43	49.43	49.09
Malleable, Valley	46.50	46.50	46.50	43.50
Malleable, Chicago	46.50	46.50	46.50	43.50
Charcoal, low phos., fob Lyles, Tenn.	66.00	66.00	66.00	62.00
Ferromanganese, f.o.b. Etna, Pa.	175.00	175.00	170.20	148.00

Scrap

Heavy melt. steel, No. 1, Pittsburgh	$21.00	$21.00	$23.25	$42.75
Heavy melt. steel, No. 2, E. Pa.	16.50	16.125	19.56	41.50
Heavy melt, steel, No. 1, Chicago	21.50	19.50	21.50	41.75
Heavy melt. steel, No. 1 Valley	19.50	18.50	22.00	42.75
Heavy melt. steel, No. 1 Cleveland	16.00	15.00	18.50	42.25
Heavy melt. steel, No. 1 Buffalo	24.25	19.50	22.81	46.56
Rails for rerolling, Chicago	34.50	27.75	27.75	64.13
No. 1 cast, Chicago	29.50	29.00	27.50	70.75

Coke

Connellsville, beehive furnace	$13.25	$13.25	$14.25	$14.38
Connellsville, beehive foundry	15.75	15.75	16.75	17.00
Chicago, oven foundry, ovens	20.00	20.00	20.40	20.40

FINISHED AND SEMIFINISHED IRON, STEEL PRODUCTS

Finished steel quoted in cents per pound and semifinished in dollars per net ton, except as otherwise noted. Prices apply on an individual producer basis to products within the range of sizes, grades, finishes and specifications produced at its plants.

Semifinished Steel

Carbon Steel Ingots: Rerolling quality, standard analysis, nominal. Forging quality, $50 per net ton, mill.

Alloy Steel Ingots: $51 per net ton, mill.

Rerolling Billets, Blooms, Slabs: $52 per net ton, mill, except: $57, Conshohocken, Pa.; $71, Fontana, Calif.

Forging Quality Billets, Blooms, Slabs: $61 per net ton, mill, except: $63, Conshohocken, Pa.; $80, Fontana, Calif.

Alloy Billets, Slabs, Blooms: Rerolling quality, $63 per net ton, mill except: $65 Conshohocken, Pa.; $82, Fontana, Calif.

Sheet Bars: Nom., per net ton, mill; sales in open market $50-$55 per gross ton.

Skelp: 3.25c per lb, mill.

Tube Rounds: $76 per net ton, mill.

Wire Rods: Basic and acid open-hearth, 7/32 & ⅜-inch, inclusive, 3.40c per lb, mill, except: 3.70c, Worcester, Mass.; 4.05c, Pittsburg, Calif.; 4.10c, Los Angeles; 4.20c, Torrance, Calif. Basic open hearth and bessemer, 7/32 to 47/64-in., inclusive, 3.50c, Sparrows Point, Md.

Bars

Hot-Rolled Carbon Bars (O.H. only; base 20 tons): 3.35c, mill, except: 3.50c Atlanta; 3.55c, Ecorse, Mich.; 3.75c, Houston; 3.95c, Kansas City; 4.00c, Fontana, Calif.; 4.05c, Pittsburg, Torrance, Calif.; 4.10c, S. San Francisco, Los Angeles, Niles, Calif.; Portland, Oreg., Seattle; 4.10c, Minnequa, Colo.

Rail Steel Bars: (Base 10 tons): 3.35c Huntington, W. Va., Moline, Ill., Williamsport, Pa.

Hot-Rolled Alloy Bars: 3.75c, mill, except: 4.05c, Ecorse, Mich.; 4.80c, Los Angeles; 4.75c, Fontana, Calif.

Cold-Finished Carbon Bars (Base 40,000 lb and over): 4.00c, mill, except: 3.95c, Pittsburgh, Cumberland, Md.; 4.20c, Indianapolis; 4.30c, Ecorse, Mich.; 4.35c, St. Louis; 4.25c, Plymouth, Mich.; 4.40c, Newark, N. J.; Hartford, Putnam, Conn., Mansfield, Readville, Mass.; 4.48c, Camden, N. J.; 5.40c, Los Angeles.

Cold-Finished Alloy Bars: 4.65c, mill, except: 4.85c, Indianapolis; 4.95c, Worcester, Mansfield, Mass., Hartford, Conn.

High-Strength, Low-Alloy Bars: 5.10c, mill, except: 5.30c, Ecorse, Mich.

Reinforcing Bars (New Billet): 3.35c, mill, except: 3.50c, Atlanta; 4.00c, Fontana, Calif.; 3.75c, Houston; 3.95c, Kansas City; 4.05c, Los Angeles, Pittsburg, Torrance, Calif. 4.10c, Seattle, S. San Francisco, 4.25c, Minnequa, Colo. Fabricated: To consumers: 4.25c, mill, except: 5.00c, Seattle.

Reinforcing Bars (Rail Steel): 3.85c, Williamsport, Pa., mill; 3.35c, Huntington, W. Va.

Wrought Iron Bars: Single Refined: 8.60c, (hand puddled), McKees Rocks, Pa.; 9.50c, Economy, Pa. Double Refined: 11.25c (hand puddled), McKees Rocks, Pa.; 11.00c, Economy, Pa. Staybolt: 12.75c, (hand puddled), McKees Rocks, Pa.; 11.30c, Economy, Pa.

Sheets

Hot-Rolled Sheets (18-gage and heavier): 3.25c, mill, except: 3.45c, Ecorse, Mich.; 3.65c, Houston; 3.35c, Conshohocken, Pa., Kokomo, Ind.; 3.95c, Pittsburg, Torrance, Calif.; 4.15c, Fontana, Calif.

Hot-Rolled Sheets (19 gage and lighter, annealed): 4.15c, mill, except: 4.40c, Alabama City, Ala.; 5.00c, Dover, O.; 5.05c, Torrance, Calif.; 4.25c, Kokomo, Ind.

Cold-Rolled Sheets: 4.00c, mill, except: 4.20c, Ecorse, Mich., Granite City, Ill.; 4.90c, Fontana, Calif.; 4.95c, Pittsburg, Calif.

Galvanized Sheets, No. 10: (Based on 5 cent zinc) 4.40c, mill except: 4.85c, Kokomo, Ind.; 5.15c, Pittsburg, Torrance, Calif.; 5.40c, Dover, O.

Galvannealed Sheets: 4.95c, mill, except: 5.05c, Kokomo, Ind.

Culvert Sheets, No. 16 flat Copper Steel (based on 5-cent zinc): 5.00c, mill, except: 5.40c, Granite City, Ill., Kokomo, Ind.; 5.75c, Pittsburg, Torrance, Calif.

Long Ternes, No. 10 (Commercial quality): 4.80c, mill.

Enameling Sheets, No. 12: 4.40c mill, except: 4.60c Granite City, Ill.; 4.70c, Ecorse, Mich.

Silicon Sheets, No. 24: Field: 5.15c, mill. Armature: 5.45c, mill.

Electrical: Hot-rolled, 5.95c, mill, except: 6.15c, Granite City, Ill.

Motor: 6.70c, mill, except: 6.90c, Granite City, Ill.

Dynamo: 7.50, mill, except: 7.70c, Granite City, Ill.

Transformer 72, 8.05c, mill; 65, 8.60c, mill, 58, 9.30c, mill, 52, 10.10c, mill.

High-Strength Low-Alloy Sheets: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Galvanized (No. 10), 6.75c, mill. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Strip

Hot-Rolled Strip: 3.25c mill, except: 3.40c, Atlanta; 3.45c, Detroit, Ecorse, Mich.;3.65c, Houston; 3.85c, Kansas City, Mo.; 4.00c, Los Angeles, S. San Francisco, Pittsburg, Torrance, Calif.; 4.25c, Seattle, 4.30c, Minnequa, Colo.; 4.10c, Fontana, Calif. One company quotes 4.90c, Pittsburgh base.

Cold-Rolled Strip: (0.25 carbon and less): 4.00c, mill, except: 4.00-4.25c, Warren, O.; 4.15c, Riverdale, Ill.; 4.20c, Ecorse, Mich.; 4.20-4.25c, Detroit; 4.50c, New Haven and Wallingford, Conn., Boston; 4.50-5.00c, Trenton, N. J.; 4.90c, Fontana, Calif., 5.75c, Los Angeles; 6.10c, Berea, O. One company quotes 4.50c, Pittsburgh base; another, 4.55c, Cleveland or Pittsburgh base, and 4.75c, Worcester, Mass., base.

Cold-Finished Spring Steel: 0.26-0.40 C, 4.00c, mill, except: 4.25c, Chicago; 4.30c, Worcester, Mass.; 4.50c, Boston, Youngstown, Wallingford, Conn.

Over 0.40 to 0.60 C, 5.50c, mill except: 5.65c, Chicago; 5.80c, Worcester, Mass., Wallingford, Conn., Trenton, N. J.; 5.95c, Boston.

Over 0.60 to 0.80 C, 6.10c, mill, except: 6.25c, Chicago; 6.40c, Worcester, Mass., Wallingford, Bristol, Conn., Trenton and Harrison, N. J.

Over 0.80 to 1.05 C, 8.05c, mill, except: 7.85c, Dover, O.; 8.20c, Chicago; 8.35c, Worcester, Mass., Bristol, Conn., Trenton and Harrison, N. J.

Over 1.05 to 1.35 C, 10.35c, mill, except: 10.15c, Dover, O.; 10.50c, Chicago; 10.65c, Worcester, Mass., Trenton and Harrison, N. J.

Cold-Rolled Alloy Strip: 9.50c, mill except: 9.80c, Worcester, Mass., Harrison, N. J.

High-Strength, Low-Alloy Strip: Hot-rolled, 4.95c, mill, except: 5.15c, Ecorse, Mich. Cold-rolled, 6.05c, mill, except: 6.25c, Ecorse, Mich.

Tin, Terne, Plate

Tin Plate: American Coke, per base box of 100 lb, 1.25 lb coating $7.50-$7.70; 1.50 lb coating $7.75-$7.95. Pittsburg, Calif., mill $8.25 and $8.50, respectively, for 1.25 and 1.50 lb coatings.

Electrolytic Tin Plate: Per base box of 100 lb. 0.25 lb tin, $6.45-$6.65; 0.50 lb tin, $6.70-$6.90; 0.75 lb tin, $7.00-$7.20.

Can Making Black Plate: Per base box of 100 lb, 55 to 128 lb basis weight $5.75-$5.85. Pittsburg, Calif., mill, $6.50.

Holloware Enameling Black Plate: 29-gage, 5.30c per pound, except: 5.50c, Granite City, Ill.

Manufacturing Ternes (Special Coated): Per base box of 100 lb, $6.65, except: $6.75 Fairfield, Ala.

Roofing Ternes: Per package 112 sheets; 20 x 28 in., coating I.C. 8-lb, $17.50.

Plates

Carbon Steel Plates: 3.40c, mill, except: 3.50c, Coatesville, Pa., Claymont, Del., Conshohocken, Pa., Harrisburg, Pa.; 3.65c, Ecorse, Mich.; 3.80c, Houston; 4.00c, Fontana, Calif.; 4.30c, Seattle, Minnequa, Colo.; 6.25c, Kansas City, Mo.

Floor Plates: 4.55c, mill.

Open-Hearth Alloy Plates: 4.40c, mill, except: 4.50c, Coatesville, Pa., mill.

High-Strength, Low-Alloy Plates: 5.20c mill, except: 5.40c, Ecorse, Mich.

Shapes

Structural Shapes: 3.25c, mill, except: 3.30c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.; 3.65c, Houston; 3.80c, S. San Francisco, Fontana, Calif.; 3.85c, Kansas City, Mo., Los Angeles, Torrance, Calif.; 3.90c, Seattle; 4.15c, Minnequa, Colo.

Alloy Structural Shapes: 4.05c, mill.

Steel Sheet Piling: 4.05c, mill.

High-Strength, Low-Alloy Shapes: 4.95c, mill, except: 5.05c, Bethlehem, Johnstown, Pa., Lackawanna, N. Y.

Wire and Wire Products

Wire to Manufacturers (carloads): Bright, Basic or Bessemer Wire, 4.15c, mill, except: 4.25c, Sparrows Point, Md., Kokomo, Ind.; 4.45c, Worcester, Palmer, Mass.; 4.50c, Minnequa, Colo., Atlanta; 4.75c, Kansas City, Mo.; 5.10c, Pittsburg, Calif.; 5.15c, S. San Francisco. One producer quotes 4.15c, Chicago base; another 4.30c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Basic MB Spring Wire, 5.55c, mill, except: 5.65c, Sparrows Point, Md.; 5.85c, Worcester, Palmer, Mass., Trenton, N. J.; 6.50c, Los Angeles, Pittsburg, Calif.

Upholstery Spring Wire, 5.20c mill, except: 5.30c, Sparrows Point, Md., 5.50c Worcester, Mass., Trenton, N. J., New Haven, Conn.; 6.15c, Los Angeles, Pittsburg, Calif.

Wire Products to Trade (carloads): Merchant Quality Wire: Annealed (6 to 8 Gage base), 4.80c, mill except: 4.90c, Sparrows Point, Md., Kokomo, Ind.; 4.95c, Atlanta; 5.10c Worcester, Mass.; 5.15c, Minnequa, Colo.; 5.75c, S. San Francisco, Los Angeles, Pittsburg, Calif. One producer quotes 4.80c, Chicago and Pittsburgh base; another, 4.95c, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago and Houston.

Galvanized (6 to 8 Gage base): 5.25c, mill, except: 5.35c, Sparrows Point, Md., Kokomo, Ind.; 5.40c, Atlanta; 5.55c, Worcester, Mass.; 5.60c, Minnequa, Colo.; 6.20c, Pittsburg, S. San Francisco, Calif. One producer quotes 5.25c, Pittsburgh and Chicago base; another, 5.40c, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Nails and Staples: Standard, cement-coated and galvanized nails and polished and galvanized staples, Col. 103, mill, except: 105, Sparrows Point, Md., Kokomo, Ind., Atlanta; 109, Worcester, Mass.; 110, Minnequa, Colo., Cleveland; 122, Pittsburg, Calif., 123, Torrance, Calif. One producer quotes Col. 103, Chicago and Pittsburgh base; another, Col. 106. Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Woven Fence (9 to 15½ Gage, inclusive): Col. 109, mill, except: 111, Kokomo, Ind., Atlanta; 116, Minnequa, Colo.; 132, Pittsburg, Calif. One producer quotes Col. 109, Pittsburgh and Chicago base; another, Col. 112, Crawfordsville, Ind., freight equalized with Pittsburgh, Birmingham, Chicago, Houston.

Barbed Wire: Col. 123 mill, except: 125, Sparrows Point, Md., Kokomo, Ind., Atlanta; 130, Minnequa, Colo.; 143, Pittsburg, Calif.; 145, S. San Francisco. One producer quotes Col. 123, Chicago and Pittsburgh base; another, Col. 126, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago, Houston.

Fence Posts (with clamps): Col. 112. Duluth, Jolliet, Ill.; Johnstown, Pa.; 116, Moline, Ill.; 122, Minnequa, Colo.; $120 per net ton, Williamsport, Pa.

Bale Ties (single loop): Col. 106, mill, except: 107, Atlanta; 108, Sparrows Point, Md., Kokomo, Ind.; 113, Minnequa, Colo.; 130, S. San Francisco, Pittsburg, Calif. One producer quotes Col. 109, Crawfordsville, Ind., freight equalized with Birmingham, Pittsburgh, Chicago and Houston.

Stainless Steels

(Mill prices, cents per pound)

CHROMIUM NICKEL STEELS

Type No.	Bars, Wire Shapes	Strip, Cold-Rolled	Sheets
301.....	28.50	30.50	37.50
302.....	28.50	33.00	37.50
303.....	31.00	36.50	39.50
304.....	30.00	35.00	39.50
316.....	46.00	55.00	53.00
321.....	34.00	44.50	45.50
347.....	38.50	48.50	50.00

STRAIGHT CHROMIUM STEELS

410.....	23.00	27.00	33.00
416.....	23.50	33.50	33.50
420.....	28.50	43.50	40.50
430.....	23.50	27.50	35.50
442.....	27.00	39.00	39.50
446.....	32.50	60.00	50.00

STAINLESS-CLAD STEELS

	Plates —Cladding—		Sheets —Cladding—	
	10%	20%	10%	20%
302.....	....	....	19.75	21.50
304.....	22.50	26.50	20.75	22.50
310.....	32.50	36.50	....	....
316.....	27.00	31.00	26.00	28.00
321.....	23.50	27.50	....	....
347.....	25.00	29.00	24.00	26.00
405.....	18.75	24.75	....	....
410.....	18.25	24.25	....	....
430.....	18.25	24.25	....	....

Tool Steels

Tool Steel: Cents per pound, producing plants; reg. carbon 19.00c; extra carbon 22.00c; special carbon 26.50c; oil-hardening 29.00c; high carbon-chromium 52.00c; chrome hot work, 29.00c.

W	Cr	V	Mo	Co	Base Per lb
18	4	1	...	...	90.50c
18	4	2	...	...	102.50c
18	4	3	...	...	114.50c
18	4	2	...	9	168.50c
1.5	4	1	8.5	...	65.00c
6.4	4.5	1.9	5	...	69.50c
6	4	3	6	...	88.00c

Bolts, Nuts

Prices to consumers, f.o.b. midwestern plants. Sellers reserve right to meet competitors' prices, if lower. Additional discounts on carriage and machine bolts, 5 for carloads; 15 for full containers, except tire and plow bolts.

Carriage and Machine Bolts

½-in. and smaller; up to 6 in. in length	35 off
⅝ and ⅝ x 6 in. and shorter.....	37 off
¾-in. and larger x 6-in. and shorter..	34 off
All diameters longer than 6-in.	30 off
Tire bolts	25 off
Plow bolts	47 off
Lag bolts, 6 in. and shorter.....	37 off
Lag bolts, longer than 6 in.	35 off

Stove Bolts

In packages, nuts separate, 58½-10 off; bulk 70 off on 15,000 of 3-in. and shorter, or 5000 over 3 in., nuts separate.

Nuts

	A.S. Light	A.S. Reg. and Heavy
Semifinished hexagon	41 off	.....
⅞-in. and smaller	.....	38 off
½-in. and smaller	39 off	.....
½-in.-1-in.	.....	37 off
⅝-in.-1-in.	37 off	35 off
1⅛-in.-1½-in.	34 off	28 off
1⅝-in. and larger.....		

Additional discount of 15 for full containers.

Hexagon Cap Screws (Packaged)

Upset 1-in. smaller by 6-in. and shorter (1020 bright).....	46 off
Upset (1035 heat treated) ⅝ and smaller x 6 and shorter.....	40 off

Square Head Set Screws

Upset 1-in. and smaller.....	51 off
¾, ⅞, & 1 x 6-in. and shorter.....	35 off
Headless, ¼-in. and larger.....	31 off

Rivets

F.o.b. midwestern plants

Structural ½-in. and larger.....	6.75c
⅞-in. and under.....	48 off

Washers, Wrought

F.o.b. shipping point, to jobbers..Net to $1 off

Tubular Goods

Standard Steel Pipe: Eastern mill carlot prices, threaded and coupled, to consumers about $200 a net ton. Discounts from base:

Butt Weld

In.	Blk.	Gal.	In.	Blk.	Gal.
⅛.....	39½–	11–	1.....	46½–	30½–
	41½	13½		48½	33½
¼.....	37½–	13–	1¼....	47–	31–
	39½	15½		49	34
⅜.....	34–	9½–	1½....	47½–	31½–
	36	12½		49½	34½
½.....	41–	23½–	2.....	48–	32–
	43	26½		50	35
¾.....	44–	27½–	2½, 3..	48½–	32½–
	46	30½		50½	35½
			3½ & 4.	44½	29

In.	Lap Weld Blk.	Lap Weld Gal.	Elec. Weld Blk.	Elec. Weld Gal.	Seamless Blk.	Seamless Gal.
2....	40½	25	38½	23	28–	12½–
					38½	23
2½..	44½	29	41½	26	33½–	18–
					41½	26
3....	44½	29	41½	26	36–	20½
					41½	26
3½&4	42½–	26–	43½	28	38½–	23–
	46½	31			43½	28
5 & 6.	42½–	26–	43½	28	43½	28
	44½	29				
7....	....	....	....	....	43½	27

Pipe Cast Iron: Class B, 6-in. and over, $82.50-$93.50 per net ton, Birmingham; $87.50, Burlington, N. J.; 4-in. pipe, $5 higher; Class A pipe, $5 a ton over Class B.

For prices on line and standard wrought iron pipe and boiler tubes, please refer to Aug. 8 issue, page 123.

Rails, Supplies

Rails: Standard, over 60-lb; $3.20 per 100 lb mill.

Light (billet): $3.55 per 100 lb, mill, except: $4.25, Minnequa, Colo.

Light (rail steel): $3.55 per 100 lb, Williamsport, Pa., Huntington, W. Va.

Railroad Supplies: Track bolts, treated: $8.50 per 100 lb, mill. Untreated: $8.25, mill.

Tie Plates: 4.05c mill, except: 4.20c, Pittsburg, Torrance, Calif.; 4.50c, Seattle.

Splice Bars: 4.25c, mill.

Standard Spikes: 5.35c, mill.

Axles: 5.20c, mill.

RAW MATERIAL AND FUEL PRICES

Minimum delivered prices do not include 3 per cent federal tax.

Pig Iron

Per Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa., furnace	$48.00	$48.50	$49.00	$49.50
Newark, N. J., del.	50.5334	51.0334	51.5334	52.0334
Brooklyn, N. Y., del.	....	52.634	53.134	....
Birmingham, furnace	38.88	39.38	....	....
Cincinnati, del.	....	45.43	....	....
Buffalo, furnace	46.00	46.50	47.00	....
Boston, del.	54.92	55.42	55.92	....
Rochester, del.	47.95	48.45	48.95	....
Syracuse, del.	49.39	49.89	50.39	....
§Chicago, district furnaces	46.00	46.50	46.50	47.00
Milwaukee, del.	47.82	48.32	48.32	48.82
Muskegon, Mich., del.	....	51.78	51.78	....
Cleveland, furnace	46.00	46.50	46.50	47.00
Akron, del.	48.3002	48.8002	48.8002	49.3002
Duluth, furnace	....	46.50	46.50	47.00
Erie, Pa., furnace	46.00	46.50	46.50	47.00
Everett, Mass., furnace	....	50.00	50.50	....
Geneva, Utah, furnace	46.00	46.50	....	....
Seattle, Tacoma, Wash., del.	....	54.0578	....	....
Portland, Oreg., del.	....	54.0578	....	....
Los Angeles, San Francisco	53.5578	54.0578	....	....
Granite City, Ill., furnace	47.90	48.40	48.90	....
St. Louis, del.	48.65*	49.15*	49.65*	....
Ironton, Utah, furnace	46.00	46.50	....	....
Lone Star, Tex., furnace	46.00	†46.50	....	....
Gulf ports, del.	50.50	51.00	....	....
Lorain, O., furnace	46.00	....	....	47.00
‡Neville Island, Pa., furnace	46.00	46.50	46.50	47.00
Pittsburgh, del., N.&S. Sides	47.08	47.58	47.58	48.08
Pittsburgh (Carnegie), furnaces	46.00	....	46.50	47.00
Sharpsville, Pa., furnace	46.00	46.50	46.50	47.00
Steelton, Pa., furnace	48.00	48.50	49.00	49.50
Steubenville, O., furnace	46.00	....	....	47.00
Struthers, O., furnace	46.00	....	....	....
Swedeland, Pa., furnace	48.00	48.50	49.00	49.50
Philadelphia, del.	49.39	49.89	50.39	50.89
Toledo, O., furnace	46.00	46.50	46.50	47.00
Cincinnati, del.	50.8230	51.3230	....	....
Troy, N. Y., furnace	48.00	48.50	49.00	....
Youngstown, O., furnace	46.00	46.50	46.50	47.00
Mansfield, O., del.	50.1022	50.6022	50.6022	51.1022

* Including 3 per cent federal transportation tax.
† Low phosphorus southern grade.
‡ To Neville Island base add: $0.86 for McKees Rocks, Pa.; $1.31 Lawrenceville, Homestead, McKeesport, Monaca; $1.73 Verona; $1.94 Brackenridge; $1.08 for Ambridge and Aliquippa.
§ Includes, in addition to Chicago, South Chicago, Ill., East Chicago, Gary and Indiana Harbor, Ind.

Blast Furnace Silvery Pig Iron

6.00-6.50 per cent Si (base)..$59.50
6.51-7.00.. 60.50 9.01- 9.50. 65.50
7.01-7.50.. 61.50 9.51-10.00. 66.50
7.51-8.00.. 62.50 10.01-10.50. 67.50
8.01-8.50.. 63.50 10.51-11.00. 68.50
8.51-9.00.. 64.50 11.01-11.50. 69.50
F.o.b. Jackson, O., per gross ton. Buffalo furnace $1.25 higher.

Bessemer Ferrosilicon

Prices same as for blast furnace silvery iron, plus $1 per gross ton.

Electric Furnace Silvery Pig Iron Si 14.01-14.50%, $71.50 furnace, Niagara Falls; $80 open-hearth and foundry grade, Keokuk, Iowa, or Wenatchee, Wash., freight allowed to normal trade area. 12½ lb piglets, $85, Keokuk, Iowa, freight allowed to normal trade area. Add $1 a ton for each additional 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 a ton for 0.45% max. P.

Charcoal Pig Iron

Semi-cold blast, low phosphorus. F.o.b. furnace, Lyles, Tenn. ....$66 (For higher silicon iron a differential over and above the price of base grade is charged as well as for the hard chilling iron, Nos. 5 and 6.)

Low Phosphorus

Steelton, Pa., Troy, N. Y., $54; Philadelphia, $56.9786 del. Intermediate phosphorus, Central Furnaces, Cleveland, $51.

Electrodes

(Threaded, with nipples, unboxed)

Inches Diam.	Length	Cents per lb f.o.b. plant
Graphite		
17, 18, 20	60, 72	16.00
8 to 16	48, 60, 72	16.50
7	48, 60	17.75
8	48, 60	19.00
4, 5½	40	19.50
3	40	20.50
2½	24, 30	21.00
2	24, 30	23.00
Carbon		
40	100, 110	7.50
35	100, 110	7.50
30	84, 110	7.50
24	72 to 104	7.50
17 to 20	84, 90	7.50
14	60, 72	8.00
10, 12	60	8.25
8	60	8.50

Fluorspar

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70% or more, $37; less than 60%, $34.

Metallurgical Coke

Price per Net Ton

Beehive Ovens	
Connellsville, furnace	$13.00-13.50
Connellsville, foundry	15.50-16.00
New River, foundry	18.00
Wise county, foundry	15.35
Wise county, furnace	14.60
Oven Foundry Coke	
Kearney, N. J., ovens	$22.00
Everett, Mass., ovens, New England, del.‡	22.70
Chicago, ovens	20.00
Chicago, del.	†21.45
Detroit, del.	23.76
Terre Haute, ovens	20.20
Milwaukee, ovens	20.75
Indianapolis, ovens	19.85
Chicago, del.	23.19
Cincinnati, del.	22.66
Detroit, del.	23.61
Ironton, O., ovens	19.40
Cincinnati, del.	21.63
Painesville, O., ovens	20.90
Buffalo, del.	23.42
Cleveland, del.	22.55
Erie, del	22.70
Birmingham, ovens	17.70
Philadelphia, ovens	20.45
Swedeland, Pa., ovens	20.40
Portsmouth, O., ovens	19.50
Detroit, ovens	20.65
Detroit, del.	*21.70
Buffalo, del.	22.95
Flint, del.	23.00
Pontiac, del.	21.98
Saginaw, del.	23.30

Includes representative switching charge of: *, $1.05; †, $1.45. ‡ Or within $4.03 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens (Price effective as of Aug. 5)

Pure benzol	20.00
Toluol, one degree	19.00-23.50
Industrial xylol	20.50-26.50
Per ton bulk, ovens	
Sulphate of ammonia	$45.00
Per pound, ovens (Effective June 1, 1949)	
Phenol, 40 (carlots, returnable drums)	13.25
Do., less than carlots	14.00
Do., tank cars	12.50
(Effective Oct. 25, 1948)	
Naphthalene flakes, balls, bbl to jobbers, "household use"	13.75

Refractories

(Prices per 1000 brick, f.o.b. plant)

Fire Clay Brick

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Ky., Clearfield, or Curwensville, Pa., Ottawa, Ill., $100. Hard-fired, $135 at above points.

High-heat Duty: Salina, Pa., $85; Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, or Curwensville, Pa., Olive Hill, Hitchins, Haldeman, or Ashland, Ky., Troup, or Athens, Tex., Stevens Pottery, Ga., Portsmouth, or Oak Hill, O., Ottawa, Ill., $80.

Intermediate-Heat Duty: St. Louis, or Vandalia, Mo., West Decatur, Orviston, Beach Creek, or Clearfield, Pa., Olive Hill, Hitchins, or Haldeman, Ky., Athens, or Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $74.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., Bessemer, Ala., Ottawa, Ill., $66.

Ladle Brick

Dry Press: $55, Freeport, Merill Station, Clearfield, Pa., Chester, New Cumberland, W. Va.; Irondale, Wellsville, O.

Wire Cut: $53, Chester, New Cumberland, W. Va.; Wellsville, O.

Malleable Bung Brick

St. Louis, Mo., Olive Hill, Ky., Ottawa, Ill., $90; Beach Creek, Pa., $80.

Silica Brick

Mt. Union, Claysburg, or Sproul, Pa., Ensley, Ala., $80; Hays, Pa., $85; Joliet or Rockdale, Ill., E. Chicago, Ind., $89; Lehi, Utah, Los Angeles, $95.

Eastern Silica Coke Oven Shapes: Claysburg, Mt. Union, Sproul, Pa., Birmingham, $80.

Illinois Silica Coke Oven Shapes: Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $81.

Basic Brick

(Base prices per net ton; f.o.b. works, Baltimore or Chester, Pa.)

Burned chrome brick, $66; Chemical-bonded chrome brick, $69; magnesite brick, $91; chemical-bonded magnesite, $80.

Magnesite

(Base prices per net ton, f.o.b. works, Chewelah, Wash.)

Domestic dead-burned, ⅜" grains; Bulk, $30.50-31.00; single paper bags, $35.00-35.50.

Dolomite

(Base prices per net ton)

Domestic, dead-burned bulk: Billmeyer, Blue Bell, Williams, Plymouth Meeting, Pa., Millville, W. Va., Narlo, Millersville, Martin, Gibsonburg, Woodville, O., $12.25; Thornton, McCook, Ill., $12.35; Dolly Siding, Bonne Terre, Mo., $12.45.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural)

Lower Lake Ports

(Any increase or decrease in R.R. freight rates, dock handling charges and taxes thereon effective after Dec. 31, 1948, are for buyer's account.)

Old range bessemer	$7.60
Old range nonbessemer	7.45
Mesabi bessemer	7.35
Mesabi nonbessemer	7.20
High phosphorus	7.20

Eastern Local Ore

Cents, unit, del. E. Pa.

Foundry and basic 56.62% concentrates, contract 16.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:
Spot 17.00
Long-term contract 15.00
Brazil iron ore, 68-69% 19.50

Tungsten Ore

Wolframite and scheelite per short ton unit, duty paid ..... $26-$28

Manganese Ore

Long term contracts, involving large tonnages, prices are nominal; nearby, 48%, duty paid, 81.8c-83.8c per long ton unit, c.i.f. United States ports; prices on lower grades adjusted to manganese content and impurities.

Chrome Ore

Gross ton f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S.C., plus ocean freight differential for delivery to Portland, Oreg., and/or Tacoma, Wash. (S S paying for discharge; dry basis, subject to penalties if guarantees are not met.)

Indian and African
48% 2.8:1 ..... 37.50
48% 3:1 ..... 39.00
48% no ratio 31.00

South African (Transvaal)
44% no ratio $25.50-26.00
45% no ratio 26.50
48% no ratio 29.00-30.00
50% no ratio 29.50-30.50

Brazilian—nominal
44% 2.5:1 lump $33.65

Rhodesian
45% no ratio .....$27-$27.50
48% no ratio 30.00
48% 3:1 lump 39.00

Domestic (seller's nearest rail)
48% 3:1 .....$39.00

Molybdenum

Sulphide conc., lb, Mo., cont., Mines $0.90

WAREHOUSE STEEL PRICES

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga. and Heavier*	C.R. 15 Ga.	Galv. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140§		Carbon	Floor
New York (city)	5.80‡	6.51	7.10	5.82	...	5.77	6.56	8.28	5.53	5.85	7.36
New York(c'try)	5.60‡	6.31	6.90	5.62	...	5.57	6.36	8.08	5.33	5.65	7.16
Boston (city)	5.70	6.70**	7.11	5.75	...	5.67	6.42	8.72	5.57	5.90	7.40
Boston (c'try)	5.55	6.55**	6.96	5.60	...	5.52	6.27	8.57	5.42	5.75	7.25
Phila. (city)	5.80	6.39	6.78	5.55	...	5.55	6.09	8.00	5.25	5.50	6.70
Phila. (c'try)	5.65	6.24	6.63	5.40	...	5.40	5.94	7.85	5.10	5.35	6.55
Balt. (city)	5.46	6.36	6.81	5.52	...	5.57	6.31	...	5.51	5.71	7.16
Balt. (c'try)	5.31	6.21	6.66	5.37	...	5.42	6.16	...	5.36	5.56	7.01
Norfolk, Va.	5.80‡	...	...	...	...	6.05	7.05	...	6.05	6.05	7.55
Wash. (w'hse)	6.07‡	...	...	5.83	...	5.88	6.62	...	5.82	6.02	7.47
Buffalo (del.)	5.00‡	5.90	7.57	5.39	6.42	5.10	5.60	10.13	5.15	5.50	7.06
Buffalo (w'hse)	4.85‡	5.75	7.42	5.24	6.27	4.95	5.40	9.60	5.00	5.35	6.91
Pitts. (w'hse)	4.85	5.75[4]*	6.80	5.00	6.00	4.90	5.40	9.20††	4.90	5.05	6.55
Detroit (w'hse)	5.32	6.22[4]*	7.35	5.42	6.42-6.73	5.48	5.90	8.44-8.59	5.48	5.67	7.02
Cleveland (del.)	5.00	5.90	6.70	5.15-5.18	6.15	5.15-5.16	5.60	7.84-8.00	5.15-5.16	5.35-5.36	6.80-6.81
Cleve. (w'hse)	4.85	5.75	6.55	5.00-5.03	6.00	5.00-5.01	5.45	7.84-7.85	5.00-5.01	5.20-5.21	6.65-6.66
Cincin. (w'hse)	5.26‡	5.94**	6.83	5.38	6.10	5.43	5.94	...	5.43	5.63	7.03
Chicago (city)	5.00-5.20‡	5.90[4]	7.00	5.00	6.67-6.83	5.05	5.60	7.85[5]	5.05	5.25	6.70
Chicago (w'hse)	4.85-5.05‡	5.75[4]	6.85	4.85	6.52-6.68	4.90	5.40	7.70[5]	4.90	5.10	6.55
Milwaukee(city)	5.18-5.38‡	6.08[4]	7.18	5.18	6.82-7.01	5.23	5.78	8.03[5]	5.23	5.43	6.88
St. Louis (del.)	5.37	6.27[4]	7.44	5.34	6.64	5.39	6.19[6]	6.64	5.39	5.59	7.04
St. L. (w'hse)	5.22	6.12[4]	7.29	5.19	6.49	5.24	6.04[6]	6.49	5.24	5.44	6.89
Birm'ham (city)	5.00	5.90	6.55	5.00	...	5.00	6.83	...	5.05	5.25	7.69
Birm'ham(c'try)	4.85	5.75	6.40	4.85	...	4.85	6.68	...	4.90	5.10	7.54
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Los Ang. (city)	6.60	8.05**	7.95	6.80	9.50	6.25	8.20	...	6.10	6.30	8.20
L. A. (w'hse)	6.45	7.90**	7.80	6.65	9.35	6.10	8.05	...	5.95	6.15	8.05
San Francisco	6.15[10]	7.50[3]	8.10	6.75[10]	8.25[3]	5.90[10]	7.55	10.85[2]	5.90	6.35	8.10
Seattle-Tacoma	6.70[7]‡	8.15[3]	8.80	6.70[7]	...	6.20[7]	8.15[1]	10.35	6.00[7]	6.35[7]	8.40[7]

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; ** 17 gage; ††as annealed.

Base quantities: 400 to 1999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 1000 lb and over; galvanized sheets, 450 lb to 1499 lb; [1]—1500 lb and over; [2]—1000 to 4999 lb; [3]—450 to 1499 lb; [4]—400 to 1499 lb; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—300 to 9999 lb; [8]—1500 to 1999 lb; [9]—400 to 3999 lb; [10]—400 lb and over; [11]—500 to 1499lb.

PRICES OF LEADING FERROALLOY PRODUCTS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si) Carlot per gross ton, $65, Palmerton, Pa.; $66, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $172 per gross ton of alloy, c.l., packed, $184; gross ton lots, packed, $199; less gross ton lots, packed, $216; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., or Welland, Ont. Base price: $174, f.o.b. Birmingham and Johnstown, Pa., furnaces; $172, Sheridan, Pa.; $175, Etna, Pa. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, San Francisco, Portland, Oreg. Shipment from Chicago warehouse, ton lots, $214; less gross ton lots, $231 f.o.b. Chicago. Add or subtract $2.15 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 80-85%). Carload, lump, bulk, max. 0.10% C, 24.75c per lb of contained Mn, carload packed 25.5c, ton lot 26.6c, less ton 27.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 0.75% C—max. 7% Si. **Special Grade:** (Mn 90% approx., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max., Si 1.5% max.). Carload, lump, bulk 18.15c per lb of contained Mn, carload packed 18.9c, ton lot 20.0c, less ton 21.2c. Delivered. Spot, add 0.25c.

Manganese Metal: (Mn 96% min., Fe 2% max., Si 1% max., C 0.20% max.). Carload 2" x D, packed 35.5c per lb of metal, ton lot 37c, less ton 39c. Delivered. Spot, add 2c.

Manganese, Electrolytic: Less than 250 lb, 35c; 250 lb to 1999 lb, 32c; 2000 to 35,999 lb, 30c; 36,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn., freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si, 8.95c per lb of alloy, carload packed, 9.70c, ton lot 10.60c, less ton 11.60c. Freight allowed. For 2% C grade, Si 15-17.5%, deduct 0.2c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l., lump, bulk, 26.5c per lb of contained Cr, c.l., packed 21.4c, ton lot 22.55c, less ton 23.95c. Delivered. Spot, add 0.25c.

"SM" High-Carbon Ferrochrome: (Cr 60-65%, Si 4-6%, Mn 4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Foundry Ferrochrome: (Cr 62-66%, C 5-7%). Contract, c.l., 8MxD, bulk 22.0c per lb of contained Cr, c.l., packed 22.9c, ton 24.25c, less ton 26.0c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: (Cr 67-72%). Contract, carload, lump, bulk, max, 0.03% C 31.85c per lb of contained Cr, 0.04% C 29.75c, 0.06% C 28.75c, 0.10% C 28.25c-28.5c, 0.15% C 28.0c, 0.20% C 27.75c, 0.50% C 27.5c, 1% C 27.25c, 1.50% C 27.1c, 2% C 27.0c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

"SM" Low-Carbon Ferrochrome: (Cr 62-66%, Si 4-6%, Mn 4-6%, C 0.75-1.25% max.). Contract, carload, lump, bulk 27.75c per lb of contained chromium, carload, packed 28.85c, ton lot 30.05c, less ton 31.85c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N. Add 5c for each 0.25% of N above 0.75%.

Chromium Metal: (Min. 97% Cr and 1% Fe). Contract, carload, 1" x D; packed, max. 0.50% C grade, $1.03 per lb of contained chromium, ton lot $1.05, less ton $1.07. Delivered. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 18.5c per lb of contained Si; packed 19.90-21.70c; ton lot 21.00-22.60c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 11.3c per lb of contained Si, carload packed 12.9c, ton lot 14.35c, less ton 16c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 13.5c per lb of contained Si, carload packed 14.8c, ton lot 15.95c, less ton 17.2c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk, 14.65-15c per lb of contained Si, carload packed 15.9c, ton lot 16.9c, less ton 18.05c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.). Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 16.5c per lb of contained Si, carload packed 17.7c, ton lot 18.65c, less ton 19.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.). Add 0.7c to above 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe.) C.l., lump, bulk, regular 19.0c per lb of Si c.l. packed 20.2c, ton lot 21.1c, less ton 22.1c. Add 1.5c for max. 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 7.40c per lb of alloy, ton lots packed 8.80c, 200 to 1999 lb 9.15c, smaller lots 9.65c. Delivered. Spot up 0.5c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 13.75c per lb of briquet, carload packed 14.45c, ton lot 15.25c, less ton 16.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk, 10.45c per lb of briquet, c.l. packaged 11.25c, ton lot 12.05c, less ton 12.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 10.30c, per lb of briquet, c.l. packaged 11.1c, ton lot 11.9c, less ton 12.8c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.15c per lb of briquet, c.l. packed 6.95c, ton lot 7.75c, less ton 8.65c. Delivered. Spot, add 0.25c.
(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 6.30c, c.l. packed 7.10c, ton lots 7.90c, less ton 8.80c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) 95.00c per pound of Mo contained. F.o.b. Langeloth, Pa.

For prices of other ferroalloy products please refer to Aug. 8 issue, Page 113.

Demand for Metals Remains Active

Substantial bookings of lead are made following ¼-cent to ⅜-cent advance in prices. Zinc and copper prices continue steady. Tin restrictions to be relaxed

New York—Following the advance in lead prices last Monday to the highest level attained since early April, bookings were initially heavy and then tapered as the week progressed. Inquiry for copper and zinc continued fairly active at unchanged prices.

Copper — Interest in the copper market centered on the testimony before the Senate Finance Committee on a bill to reimpose the 2-cent a pound prewar duty on imported copper. Senator McFarland (Dem., Ariz.) suggested a 4 to 6-cent per pound tariff on copper to meet competition from Chilean producers. Joining him in support of the bill were Senator Hayden (Dem., Ariz.), W. W. Lynch, representing copper companies in ten states, and Sam H. Morris, Globe, Ariz., chairman, Arizona Copper Tariff Board.

C. Donald Dallas, chairman, Revere Copper & Brass Inc., said reimposition of a copper import tax would place consumers in a serious position because of a prospective deficit in domestic copper supplies of 30,000 to 40,000 tons a month. He estimated consumption of copper by industry at 100,000 tons a month for the next three months and requirements of about 10,000 tons a month for the government's stockpile. Against this, current curtailment of domestic copper production from all sources has lowered the monthly prospective supply to about 62,000 tons, leaving a net deficit of about 30,000 to 40,000 tons which will have to be met from foreign sources. Others opposing the new duty are: Simon Strauss, American Smelting & Refining Co., New York; Norman Hickman, vice president, American Metals Co., New York; Roger E. Gay, president, Bristol Brass Corp., Bristol, Conn.; A. D. R. Frazer, president, Rome Cable Corp., Rome, N. Y.

Demand for copper at the 17.62½-cent Connecticut level for electrolytic is sufficient to maintain a firm market undertone. Rodolfo Michels, vice president, Anaconda Copper Mining Co., is quoted as saying in Santiago, Chile, that the present low prices in the world copper market will prevail for some time. He pointed out that the United States government purchases would not exceed 120,000 tons, which is less than 10 per cent of consumption in that country. He said that at the time when the drop in copper price occurred, world demand totaled about 150,000 tons a month and production exceeded 200,000 tons.

Brass and Bronze Ingots: White Bros. Smelting Corp., Philadelphia, raised its selling prices of brass and bronze ingots ½-cent to ¾-cent a pound, effective Aug. 9. This action reflects the higher prices now prevailing in the red metal scrap market.

Lead—Prices advanced ¼-cent to ⅜-cent a pound on Aug. 8, resulting in a split market. A leading custom smelter initiated the rise by posting a ⅜-cent advance while St. Joseph Lead Co. advanced prices ¼-cent. The market is now quoted 14.80c to 14.97½c, St. Louis, for the common grade. Substantial tonnages were booked by sellers at the higher levels. Demand however, was not so heavy toward the end of the week. While some consumers have been unable to obtain desired tonnages on a flat price basis, the waiting lists are smaller than they were before the advance.

Producers of lead, sheet, pipe and oxides advanced their prices in line with the higher primary market.

Zinc—Satisfactory volume of business is being booked in the slab zinc market with prices holding firm at 10.00c, East St. Louis, for prime western.

Statistics issued by the American Zinc Institute reflect the improved consuming demands for zinc. Shipment to domestic users totaled 62,443 tons in July, an increase of 17,623 tons over the June total. Shipments on export and drawback account dropped sharply, however, to 3111 tons from 14,055 tons in June. Zinc concentrates smelted for account of the government in July resulted in the addition of 6526 tons to the national stockpile, compared with 8025 tons in June, making a total of 58,839 tons for the first seven months against only 23,826 tons in the like 1948 period.

Smelter production in July totaled 74,569 tons compared with 73,989 tons in June. On a daily average rate, production eased to 2405 tons from 2466 tons in June. Stocks showed a net increase of about 2500 tons, totaling 85,408 tons as of July 31.

Unfilled orders on the books of producers on July 31 amounted to 53,423 tons, an increase of 10,700 tons over the previous month.

Tin—Additional easing in restrictions on the use of tin is expected to be announced soon. Department of Commerce indicates that it will be at least another week before any further relaxations are made in its tin conservation orders. The government has requested that "applications for uses of tin not now included in these conservation orders (M-43 and M-81) be withheld until the issuance of the new amended orders."

There has been no indication so far that a change in price levels is contemplated. Straits tin holds at $1.03, New York.

Aluminum Castings Shipments

WASHINGTON—Shipments of aluminum and aluminum-base alloy castings during May amounted to 21,392,000 pounds, a decline of 10 per cent from the 23,801,000 pounds shipped in April, reports Bureau of the Census. May shipments were 37 per cent below the 33,868,000 pounds shipped in May, 1948. last

Shipments of permanent mold castings during May totaled 7,300,000, 13 per cent below April shipments of 8,400,000 pounds. Sand castings shipped in May totaled 7,600,000 pounds compared with 8 million pounds shipped in April. Die castings shipments dropped to 6 million pounds in May from 6,900,000 pounds in April and shipments of "all other" aluminum castings dropped to 532,- pounds from 531,000 pounds in April.

May shipments of commercial aluminum castings, totaling 15,800,000 pounds, amounted to 74 per cent of the total. The remaining 5,600,000 pounds were produced for the manufacturers' own use.

Order backlog for commercial castings at the end of May was 41 million pounds, or about two and one-half months' activity at the current rate of shipments.

Shipments during the first five months of this year amounted to 129,041,000 pounds against 189,783,000 pounds in the like 1948 period.

Mercury Price Declines $3

New York — Domestic quicksilver prices declined $3 per flask to $75 a flask of 76 pounds, the first sale at this level having been made Aug. 5. The price now ranges from $75 a flask for large lots up to $78 for smaller quantities.

Demand for quicksilver from consuming industries has been declining for several months. At present, inquiry from the makers of thermometers and instruments for gages and other recording devices is at a low point. Manufacturers of chemical products also are inactive as buyers of this metal.

The Spanish-Italian Mercury Combine has not changed its price from the $70 level established in mid-December, 1948. After including the import duty and other charges, this price is equivalent to $92-$93 a flask landed in the United States.

The United States government has received for its permanent stockpile about 100,000 flasks of the metal from Italian sources, trade authorities say.

Magnesium Castings Shipments

Washington—Shipments of magnesium and magnesium-base alloy castings during May totaled 778,000 pounds, an increase of 7 per cent from the 726,000 pounds shipped in April and 25 per cent above the 622,000 pounds shipped in May, 1948, reports the Bureau of the Census. Commercial castings accounted for 93 per cent of the total shipments in May. Unfilled orders for commercial castings at the end of May indicated a backlog of about 4 months' activity at the current rate of operations.

Total shipments of magnesium and magnesium-base alloy castings during the first five months of this year amounted to 4,018,000 pounds, compared with 3,313,000 pounds in the similar period of 1948.

NONFERROUS METAL PRICES

(Cents per pound, carlots, except as otherwise noted)

Copper: Electrolytic 17.62½c, Conn. Valley, Lake, 17.75c, Conn. Valley.

Brass Ingot: 85-5-5-5 (No. 115) 15.00-16.00c; 88-10-2 (No. 215) 24.00c; 80-10-10 (No. 305) 20.50c; No. 1 yellow (No. 405) 12.75-13.75c.

Zinc: Prime western 10.00c, brass special 10.25c, intermediate 10.50c, East St. Louis; high grade 11.00c, delivered.

Lead: Common 14.80-14.97½c; chemical, 14.90c; corroding, 14.90-15.07½, St Louis.

Primary Aluminum: 99% plus, ingots 17.00c, pigs 16.00c. Base prices for 10,000 lb and over, f.o.b. shipping point.

Secondary Aluminum: Piston alloys 16.50-16.75c; No. 12 foundry alloy (No. 2 grade) 15.00-15.25c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 16.75-17.25c; grade 2, 15.50-16.25c; grade 3, 14.50-15.25c; grade 4, 13.50-14.25c. Prices include freight at carload rate up to 75 cents per 100 lb.

5% titanium-aluminum alloy No. 1 (low Cu) 31.00c; No. 2 (2% Cu) 28.00c, f.o.b. Eddystone, Pa.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over, 20.50c, f.o.b. Freeport, Tex.

Tin: Grade A, 99.8% or higher (including Straits) $1.03; grade B, 99.8% or higher, not meeting specifications for grade A, with 0.05% max. arsenic, $1.028; grade C, 99.65-99.79%, incl., $1.024; 99.5-99.649% $1.024, grade F, 98-98.999% $1.015 for tin content. Prices are ex-dock, New York, in 5-ton lots.

Antimony: American 99-99.8% and over but not meeting specifications below, 38.50c; 99.8% and over (arsenic 0.05% max.; other impurities, 0.1% max.) 39.00c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 40.00c; 25-lb pigs, 42.50c; "XX" nickel shot, 43.50c; "F" nickel shot or ingots, for addition to cast iron, 40.50c. Prices include import duty.

Mercury: Open market, spot, New York $75-$78 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $24.50 per lb contained Be.

Cadmium: "Regular" straight or flat forms, $2 del.; special or patented shapes, $2.15.

Cobalt: 97-98%, $1.80 per lb for 550 lb (keg); $1.82 per lb for 100 lb (case); $1.87 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York, 71.50c per ounce.

Platinum: $69-$72 per ounce.

Palladium. $24 per troy ounce.

Iridium: $100-$110 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill; based on 16-cent copper.)

Sheet: Copper 31.30; yellow brass 28.19; commercial bronze, 95%, 31.28; 90%, 30.84; red brass, 85%, 29.89; 80%, 29.47; best quality, 29.01; nickel silver, 18%, 41.78; phosphor-bronze, grade A, 5%, 50.47.

Rods: Copper, hot rolled 27.15; cold drawn 28.40; yellow brass free cutting, 22.76; commercial bronze, 95% 30.97; 90% 30.53; red brass 85% 29.58; 80% 29.16.

Seamless Tubing: Copper 31.34, yellow brass 31.20; commercial bronze 90% 33.50; red brass 85% 32.80; 80% 32.38.

Wire: Yellow brass 28.48; commercial bronze, 95% 31.57; 90% 31.13; red brass, 85% 30.18; 80% 29.76; best quality brass 29.30.

Copper Wire: Bare soft, f.o.b., eastern mills, 100,000 lb lots, 23.42½, l.c.l. 24.05, c.l. 23.55; weatherproof, f.o.b. eastern mills, 100,000 lb lots, 25.193, l.c.l. 25.943, c.l. 25.443; magnet, delivered, c.l. 27.62½, 15,000 lb or more 27.87½, l.c.l. 28.37½.

ALUMINUM

Sheets and Circles: 2s and 3S mill finish c.l

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	26.9	...	...
0.135-0.096	12-48	27.4	...	...
0.095-0.077	12-48	27.9	26.0	29.6
0.076-0.068	12-48	28.5	26.2	29.8
0.067-0.061	12-48	28.5	26.2	29.8
0.060-0.048	12-48	28.7	26.4	30.1
0.047-0.038	12-48	29.1	26.6	30.4
0.037-0.030	12-48	29.5	27.0	30.9
0.029-0.024	12-48	29.9	27.3	31.3
0.023-0.019	12-36	30.5	27.7	31.8
0.018-0.017	12-36	31.1	28.3	32.6
0.016-0.015	12-36	31.8	28.9	33.5
0.014	12-24	32.7	29.7	34.6
0.013-0.012	12-24	33.6	30.4	35.5
0.011	12.24	34.6	31.3	36.7
0.010-0.0095	12-24	35.6	32.3	38.0
0.009-0.0085	12-20	36.8	33.4	39.5
0.008-0.0075	12-20	38.1	34.6	41.1
0.007	12-18	39.5	35.9	42.9
0.006	12-18	41.0	37.2	47.0

* Minimum length, 60 inches. † Maximum diameter, 24 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	48.0	...	...
0.156-0.203	41.0	...	...
0.219-0.313	38.0	...	...
0.344	37.0	...	47.0
0.375	36.5	45.5	44.0
0.406	36.5	...	...
0.438	36.5	45.5	44.0
0.469	36.5	...	...
0.500	36.5	45.5	44.0
0.531	36.5	...	...
0.563	36.5	...	41.5
0.594	36.5	...	...
0.625	36.5	43.0	41.5
0.656	36.5	...	...
0.688	36.5	...	41.5
0.750-1.000	35.5	40.5	39.0
1.063	35.5	...	37.5
1.125-1.500	34.5	39.0	37.5
1.563	34.5	...	37.5
1.625	33.5	...	36.5
1.688-2.000	33.5	...	...
2.125-2.500	32.5	...	...
2.625-3.375	31.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more, $20.12½ per cwt; add 50c per cwt, 10 sq ft to 140 sq ft. Pipe: Full coils, $20.12½ per cwt. Traps and Bends: List price plus 55%.

ZINC

Sheets, 14.50c f.o.b. mill, 36,000 lb and over. Ribbon zinc in coils, 14.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 13.00c; over 12-in., 14.00c.

NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 60.00c. Strip, cold-rolled 66.00c. Rods and shapes, 56.00c. Plates 58.00c. Seamless tubes, 89.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 47.00c; Strip, cold-rolled, 50.00c. Rods and shapes, 45.00c. Plates, 46.00c. Seamless tubes, 80.00c. Shot and blocks, 40.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.312 in. in diameter, less than 25 lb, 52.00-56.00c; 25 to 99 lb, 42.00-46.00; 100 lb to 4000 lb, 35.00-36.00c.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 25.50c; 5 tons and over 26.00c; 1 to 5 tons, 26.50c; less than 1 ton, 27.00c

Copper Anodes: Base, 2000 to 5000 lb; f.o.b. shipping point, freight allowed; Flat untrimmed 27.96c; oval 27.46c; cast 25.99c.

Copper Cyanide: 70-71% Cu, 100-lb drums, 45.00, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98%, ½-oz ball, in 200 lb drums, 1 to 900 lb, 18.00c; 1000 to 19,000 lb, 17.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 250 lb, 25.25c; over 250 lb, 24.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 56.00c; 10,000 to 30,000 lb, 57.00c; 3000 to 10,000 lb, 58.00c; 500 to 3000 lb, 59.00c; 100 to 500 lb, 61.00c; under 10 lb, 64.00c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 26.50c; 400-lb bbl, 24.50c, f.o.b. Cleviand, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, 119.00c; 500 to 999 lb, 119.50c; 200 to 499 lb, 120.00c; less than 2090 lb, 121.50c; ball, 1000 lb and over, 121.25c; 500 to 999 lb, 121.75c; 200 to 499 lb, 122.25; less than 200 lb, 123.75c f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers 71.8c; 100 or 300 lb drums only, 100 to 500 lb, 63.6c; 600 to 1900 lb, 61.2c; 2000 to 9900 lb, 59.4c, f.o.b. Sewaren, N. J. On 100 or 350 lb drums only, 100 to 600 lb, 63.3c; 700 to 1900 lb, 60.9c; 2000 to 9900 lb, 59.1c; 10,000 lb and over, 58.00c, f.o.b. Carteret, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100-lb drums 40.50c, f.o.b. Cleveland; 39.25c, Detroit; 39.25c, Philadelphia.

Stannous Sulphate: Less than 2000 lb in 100 lb kegs, 100.00c, in 400 lb bbl, 99.00c; more than 2000 lb, in 100 lb kegs, 99.00c, in 400 lb bbl, 98.00c, f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, 88.00c; 100 lb kegs, 89.00c, f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 15,000 lb f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	14.62½	14.62½	13.87½
Yellow brass	12.00	11.75	11.00
Commercial Bronze 95%	13.62½	13.37½	12.87½
90%	13.50	13.25	12.75
Red Brass 85%	13.25	13.00	13.12½
80%	13.00	12.75	12.25
Best Quality (71-80%)	12.87½	12.62½	12.12½
Muntz Metal	11.12½	10.87½	10.37½
Nickel, silver, 10%	14.00	13.75	7.00
Phos. bronze, A	16.37½	16.12½	15.12½
Naval brass	11.62½	11.37½	10.87½
Manganese bronze	11.62½	11.37½	10.75

BRASS INGOT MAKERS BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 13.75, No. 2 copper 12.75, light copper 11.75, composition red brass 10.50-10.75; radiators 8.75, heavy yellow brass 8.00-8.25.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 14.25, No. 2 copper 13.25, light copper 12.25, refinery brass (60% copper) per dry copper content 12.00.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and Brass: Heavy copper and wire No. 1 12.25-12.50, No. 2 11.25-11.50, light copper 10.00-10.50, No. 1 composition red brass 8.75-9.00, No. 1 composition turnings 8.50-8.75, mixed brass turnings 5.50-5.75, new brass clippings 10.00-10.50, No. 1 brass rod turnings 7.50-7.75, light brass 5.50-5.75, heavy yellow brass 6.00-6.25, new brass rods ends 7.50-7.75, auto radiators, unsweated 7.25-7.50, cocks and faucets, 7.25-7.50, brass pipe 7.75-8.00.

Lead: Heavy 11.25-11.75, battery plates 7.00-7.25, linotype and stereotype 11.75-12.00, electrotype 10.50-11.00, mixed babbitt 11-75-12.00, solder joints, 14.50-15.00.

Zinc: Old zinc 4.00-4.50, new die cast scrap 3.50-4.00, old die cast scrap 2.50.

Tin: No. 1 pewter 52.00-54.00, block tin pipe 70.00-72.00, No. 1 babbitt 40.00-42.00.

Aluminum: Clippings 2S 9.50-10.00, old sheets 5.50-6.00, crankcase 6.25-6.50,, borings and turnings 3.00-3.50, pistons, free of struts, 5.50-6.00.

DAILY PRICE RECORD

	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
July Avg.	17.279	13.335	9.346	103.000	17.000	38.500	40.000	71.500
June Avg.	16.606	11.850	9.548	103.000	17.000	38.500	40.000	71.500
May Avg.	18.045	13.566	11.880	103.000	17.000	38.500	40.000	71.500
Aug. 1	17.62½	14.30-14.35	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 2-6	17.62½	14.55-14.60	10.00	103.00	17.00	38.50	40.00	71.50
Aug. 8-11	17.62½	14.80-14.97½	10.00	103.00	17.00	38.50	40.00	71.50

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. E. St. Louis; Zinc, prime western, del. St. Louis; Tin, Straits, del. New York; Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

OPEN MARKET PRICES, IRON AND STEEL SCRAP

Prices are dollars per gross ton, including broker's commission, delivered at consumer's plant except where noted.

PITTSBURGH

No. 1 Heavy Melt.	$21.00‡
No. 2 Heavy Melt.	19.00*
No. 1 Busheling	21.00
No. 1 Bundles	21.00
No. 2 Bundles	17.00-17.50*
No. 3 Bundles	16.50-17.00*
Heavy Turnings	16.50-17.00*
Machine Shop Turnings	14.50-15.00†
Mixed Borings, Turnings	14.50-15.00†
Short Shovel Turnings.	16.50-17.50
Cast Iron Borings	16.00-17.00
Low Phos. Steel	23.00-23.50

Cast Iron Grades

No. 1 Cupola Cast	24.00-26.00
No. 1 Machinery Cast.	31.00-32.00
Charging Box Cast	26.00-26.50
Heavy Breakable Cast.	23.50-24.50
Brake Shoe	26.50-27.00

Railroad Scrap**

No. 1 R.R. Heavy Melt.	23.00-23.50
Axles	26.00-26.50
Rails, Random Length	25.50-26.50
Rails, 2 ft and under.	28.50-29.50
Rails, 18 in. and under	30.50-31.50
Railroad Specialties	24.50-26.50
Angles, Splice Bars	24.50-26.50

‡Brokers paying up to $23 to cover on $21 orders.
*Nominal.
†Crushers' buying prices.
**Brokers purchase prices.

CLEVELAND

Heavy Melt. Steel	$15.00-16.50
No. 1 Busheling	15.50-16.50
No. 2 Bundles	13.50-14.50
Machine Shop Turnings	9.50-10.00
Mixed Borings, Turnings	15.00-15.50
Short Shovel Turnings.	15.00-15.50
Cast Iron Borings	15.00-15.50
Bar Crops and Plate	16.50-17.50
Punchings & Plate Scrap	16.50 17.50
Cut Structurals	17.50-18.50

Cast Iron Grades†

No. 1 Cupola	29.00-31.00
Charging Box Cast	24.00-25.00
Stove Plate	25.00-26.00
Heavy Breakable Cast.	22.00-23.00
Unstripped Motor Blocks	20.50 21.00
Malleable	24.00-25.00
Brake Shoes	21.00-22.00
Clean Auto Cast	32.00-33.00
No. 1 Wheels	25.00-26.00
Burnt Cast	22.00-23.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00-22.00
R.R. Malleable	26.00-27.00
Rail, 3 ft and under	29.00-30.00
Rails, Random Lengths	26 00-27.00
Cast Steel	22.50-23.50
Railroad Specialties	22.50-23.50
Uncut Tires	24.00
Angles, Splice Bars	28.00

† Nominal.

VALLEY

Heavy Melt. Steel	$19.50
No. 1 Bundles	19.50
No. 2 Bundles	16.50
Machine Shop Turnings	11.00-11.50
Short Shovel Turnings.	16.00-17.00
Cast Iron Borings	16.00-17.00
Low Phos.	20.50-21.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	21.00-22.00

MANSFIELD

Machine Shop Turnings	$11.00-11.50
Short Shovel Turnings.	15.00-15.50

CINCINNATI

No. 1 Heavy Melt. Steel	**$18.00**
No. 2 Heavy Melt. Steel	**17.00**
No. 1 Busheling	**17.00**
No. 1 Bundles	**18.00**
No. 2 Bundles	**16.00**
Machine Shop Turnings	9.00
Mixed Borings, Turnings	9.00
Short Shovel Turnings.	10.00
Cast Iron Borings	10.00

Cast Iron Grades

No. 1 Cupola Cast	28.00
Charging Box Cast	22.00
Heavy Breakable Cast	24.00
Stove Plate	20.00
Unstripped Motor Blocks	17.00
Brake Shoes	17.00
Clean Auto Cast	29.00
Drop Broken Cast	33.50

Railroad Scrap

No. 1 R.R. Heavy Melt	20.00
R.R. Malleable	23.00
Rails, Rerolling	26.00
Rails, Random Lengths	25.00
Rails, 18 in. and under	33.50

DETROIT

(Brokers' buying prices, f.o.b. shipping point)

No. 1 Bundles	$15.50-16.00
No. 2 Bundles	12.00-12.50
No. 2 Heavy Melt. Steel	12.50-13.00
No. 1 Busheling	15.50-16.00
Machine Shop Turnings	9.50-10.00
Mixed Borings, Turnings	9.50-10.00
Short Shovel Turnings	11.00-11.50
Cast Iron Borings	11.00-11.50
Punchings & Plate Scrap	15.50-16.00

Cast Iron Grades

No. 1 Cupola Cast	25.00-26.00
Heavy Breakable Cast.	21.00-22.00
Clean Auto Cast	25.00-26.00

BUFFALO

No. 1 Heavy Melt. Steel	$24.00-24.50
No. 2 Heavy Melt. Steel	20.00-20.50
No. 1 Bushelings	20.00-20.50
No. 1 Bundles	20 00-20.50
No. 2 Bundles	18.00-18.50
Machine Shop Turnings	12.00-12.50
Mixed Borings, Turnings	15.00-15.50
Cast Iron Borings	15.00-15.50
Short Shovelings	16.00-16.50
Low Phos.	24.50-25.00

Cast Iron Grades

No. 1 Cupola	29.50-30.00
Mixed Yard	28.00-28.50
Malleable	29.50-30.00
Heavy Breakable	29.50-30.50

Railroad Scrap

Rails, 3 ft. and under	34 00-34.50
Scrap rails	30.00-30.50
Specialties	29.00-29.50

PHILADELPHIA

No. 1 Heavy Melt. Steel	$17.00-18.00
No. 2 Heavy Melt. Steel	16.00-17.00
No. 1 Busheling	17.00-18.00
No. 1 Bundles	17.00-18.00
No. 2 Bundles	15.00-16.00
Machine Shop Turnings	12.00
Short Shovel Turnnings.	13.50
Mixed Borings Turnings	12.00
Bar Crop and Plate	20.50-21.50
Punchings & Plate Scrap	21.50-22.00
Cut Structurals	20.50-21.50
Elec. Furnace Bundles.	18.50
Heavy Turnings	17.00-18.00
No. 1 Chemical Borings	16.00-17.00

Cast Iron Grades

No. 1 Cupola Cast	26.00-28.00
No. 1 Machinery Cast	28.00-30.00
Charging Box Cast	24.00-25.00
Heavy Breakable Cast.	24.00-25.00
Unstripped Motor Blocks	20.00
Clean Auto Cast	28.00-30.00
No. 1 Wheels	29.00-30.00

NEW YORK

(Brokers' buying prices f.o.b. shipping point)

No. 1 Heavy Melt. Steel	$13.00-13.50
No. 2 Heavy Melt. Steel	12.00-12.50
No. 1 Busheling	12.00-12.50
No. 1 Bundles	13.00-13.50
No. 2 Bundles	11.00-11.50
No. 3 Bundles	nominal
Machine Shop Turnings	5.00-5.50
Mixed Borings, Turnings	5.00-5.50
Short Shovel Turnings.	6.50-700
Punchings & Plate Scrap	16.00
Cut Structurals	16.00
Elec. Furnace Bundles.	17.00

Cast Iron Grades

No. 1 Cupola Cast	21.00-22.00
No. 1 Machinery	22.00-23.00
Charging Box Cast	19.00-19.50
Heavy Breakable	19.00-19.50
Unstripped Motor Blocks	15.00-16.00
Malleable	nom.

BOSTON

(F.o.b. shipping point)

No. 1 Heavy Melt. Steel	$11.50
No. 2 Heavy Melt. Steel	10.00-11.00
No. 1 Bundles	10.00-10.50
No. 1 Busheling	10.00-10.50
Machine Shop Turnings	5.00-5.50
Mixed Borings, Turnings	4.50-5.00
Short Shovel Turnings.	6.00-6.50
Bar Crops and Plate.	11.00-12.00
Punchings & Plate Scrap	11.00-12.00
Chemical Borings	7.50-7.75

Cast Iron Grade

No. 1 Cupola Cast	22.00
Mixed Cast	20.00
Heavy Breakable Cast.	15.00-15.25
Stove Plate	18.00-19.00
Unstripped Motor Blocks	16.00-17.00

CHICAGO

No. 1 Heavy Melt. Steel	$21.00-22.00
No. 2 Heavy Melt. Steel	19.00-20.00
No. 1 Bundles	21.00-22.00
No. 2 Bundles	17.00-18.00
No. 3 Bundles	14.00-15.00
Machine Shop Turnings	13.00-14.00
Mixed Borings, Turnings	12.00-13.00
Short Shovel Turnings	16.00-17.00
Cast Iron Borings	14.00-15.00
Bar Crops and Plate	23.00-24.00
Punchings	23.00-24.00
Elec. Furnace Bundles.	22.00-23.00
Heavy Turnings	18.00-19.00
Cut Structurals	22.00-23.00

Cast Iron Grades

No. 1 Cupola Cast	33.00-35.00
Clean Auto Cast	32.00-34.00
No. 1 Wheels	29.00-31.00

Railroad Scrap

No. 1 R.R. Heavy Melt	25.00-26.00
Malleable	27.00-28.00
Rails, Rerolling	34.00-35.00
Rails, Random Lengths	27.00-28.00
Rails, 2 ft. and under	27.00-28.00
Rails, 18 in. and under	33.00-34.00
Railroad Specialties	29.00-30.00
Angles, Splice Bars	29.00-30.00

ST. LOUIS

No. 1 Heavy Melt. Steel	$22.00-23.00
No. 2 Heavy Melt. Steel	18.00-19.00
Machine Shop Turnings	12.00-13.00
Short Shovel Turnings	12.00-13.00

Cast Iron Grades

No. 1 Cupola Cast	30.00-31.00
Charging Box Cast	23.00-24.00
Heavy Breakable Cast.	22.00-23.00
Brake Shoes	23.00-24.00
Clean Auto Cast	32.00-33.00
Burnt Cast	23.00-24.00

Railroad Scrap

R. R. Malleable	23.00-24.00
Rails, Rerolling	28.00-29.00
Rails, Random Lengths	26.00-27.00
Rails, 3 ft. and under	29.00-31.00
Uncut Tires	21.00-22.00
Angles, Splice Bars	27.00-28.00

BIRMINGHAM

No. 1 Heavy Melt. Steel	$18.00
No. 2 Heavy Melt. Steel	18.00
No. 1 Busheling	18.00
No. 2 Bundles	16.00
Machine Shop Turnings	13.00
Mixed Borings, Turnings	15.00
Short Shovel Turnings.	15.00
Cast Iron Borings	15.00
Bar Crops and Plate	23.50
Cut Structurals	23.00

Cast Iron Grades

No. 1 Cupola Cast	31.00-33.00
Stove Plate	27.00
No. 1 Wheels	17.00-18.00

STEELMAKING SCRAP COMPOSITE

Aug. 13	$20.00
Aug. 6	19.34
July 1949	19.21
Aug. 1948	43.33
Aug. 1944	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00-21.00
R. R. Malleable	nominal
Rails, Rerolling	23.00-24.00
Rails 3 ft. and under.	25 00-26.00
Angles and Splice Bars	22.00-23.00

SAN FRANCISCO

No. 1 Heavy Melt. Steel	$17.00
No. 2 Heavy Melt. Steel	15.00
Nos. 1 & 2 Bundles	13.00

Cast Iron Grades

No. 1 Cupola Cast	23.00-25.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	17.00
Wheels	17.00
Rails, Random Lengths	17.00

SEATTLE

No. 1 Heavy Melt. Steel	$16.00
No. 2 Heavy Melt. Steel	16.00
No. 1 Bushelings	13.50
Nos. 1 & 2 Bundles	14.00
No. 3 Bundles	nom.
Machine Shop Turnings	11.00
Mixed Borings, Turnings	11.00
Punchings & Plate Scrap	22.00
Cut Structural	22.00
Elec. Furnace Bundles.	25.00

Cast Iorn Grades

No. 1 Cupola Cast	20.00-22.00
Heavy Breakable Cast.	17.00
Stove Plate	20.00
Unstripped Motor Blocks	20.00
Malleable	23.00
Brake Shoes	23.00
Clean Auto Cast	23.00
No. 1 Wheels	22.00

Railroad Scrap

No. 1 R.R. Heavy Melt.	18.00
Railroad Malleable	22.00
Rails, Random Lengths	18.00
Angles and Splice Bars	18.00

LOS ANGELES

(F.o.b. car, Los Angeles)

No. 1 Heavy Melt. Steel	$20.00
No. 2 Heavy Melt. Steel	18.00
Nos. 1 & 2 Bundles	16.00
No. 3 Bundles	nom.
Machine Shop Turnings	12.00
Mixed Borings, Turnings	12.00
Punchings & Plate Scrap	24.00
Electric Furnace Bundles	26.00

Cast Iron Grades

No. 1 Cupola Cast	27.50

Railroad Scrap

No. 1 R.R. Heavy Melt.	20.00
Rails, Rerolling	25.00

HAMILTON, ONT.

(Ceiling prices, delivered)

Heavy Melt.	$21.00
No. 1 Bundles	21.00
Mechanical Bundles	19.00
Mixed Steel Scrap	17.00
Mixed Borings, Turnings	15.00
Rails, Remelting	21.00
Rails, Rerolling	24.00
Busheling	15.00
Bushelings new factory, prep'd	19.00
Bushelings new factory, unprep'd	14.00
Short Steel Turnings	15.00

Cast Iron Grades*

Cast	26.00

* Removed from price control Aug. 9, 1947; quoted on basis of f.o.b. shipping point.

How's this Experience?

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... THICKNESS!
... SHAPE!
... ANALYSIS!

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MAGNESIUM ALLOYS
ALUMINUM ALLOYS
COPPER ALLOYS • BRASS ALLOYS

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20 TON SCALE CAR

DOUBLE HOPPER BOTTOM DUMP

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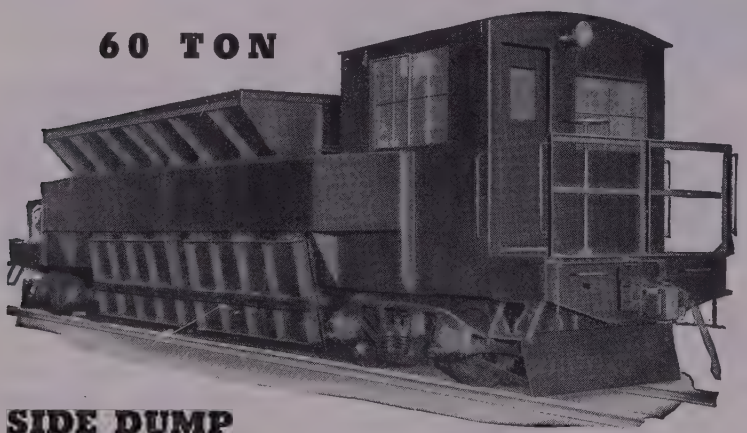
60 TON



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900 cu. ft. capacity, two-section hopper with electric heaters. Each section has independently-operated discharge gates. Car is equipped with air brakes, automatic couplers, headlights and whistle. Each truck mounts one 75-HP motor.

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ENGINEERS MANUFACTURERS

1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

Sheets, Strip . . .

Demand increases in East as consumers step up purchases for inventory purposes

Sheet Prices, Page 144

New York—A further gain in sheet demand has developed, but it is not accompanied by a corresponding increase in actual consumption. A substantial portion of new buying is for building up inventories, which in a number of instances had been allowed to get extremely low, partly because of the expectation of lower prices which has not materialized. This outlook has changed, with no early reductions in prospect, certainly none before the settlement of the management-labor dispute.

Stringency in coated and cold-rolled sheets continues, with sellers generally booked well into October on the former and through September on the latter. Hot sheet tonnage can still be had without difficulty for shipment before the end of this quarter, although some sellers appear to be fully scheduled. Meanwhile, the trade generally is keeping a close eye on developments in the automotive field. Should the management - labor dispute in that industry be settled without a strike, cutbacks in automotive requirements might prove very substantial, as it is believed that this industry has done more protective covering than any other.

Boston—Moderate increase in demand for flat-rolled products is accompanied by slightly more forward buying and pressure for delivery by early September. October schedules for carbon sheets, notably cold-rolled, are filling while some tonnage wanted next month is not available. Some consumers who disposed of top-heavy inventories earlier are buying again, including stove manufacturers who are placing orders for cold-finished and enameling stock. Increase in orders is primarily due to: Hedge against a possible steel strike, lower inventories and resumption of operations following vacation closings.

Philadelphia—Sheet business is being sustained at the slightly improved rate of the past two or three weeks. While one district mill can do three weeks on the heavier gages of hot rolled, some have little to offer under six weeks; when it comes to galvanized and cold-rolled sheets, all appear to be definitely out of the market for the remainder of the quarter. In fact, in galvanized sheets, some mills are virtually booked up throughout October. However, the coated sheet situation should ease later in the fall as government grain bin requirements should taper rapidly from that time on. Alan Wood Steel Co.'s sheet mill at Conshohocken, Pa., is scheduled to resume this week after a 2-week suspension for mass vacations.

Pittsburgh — Automotive requirements remain major support of sheet and strip production schedules, although a slight gain in specifications from stove and refrigerator manufacturers is noted. Output of galvanized sheets continues to fall short of meeting demand for grain storage and other programs. Mill de-

Four typical machine shops report

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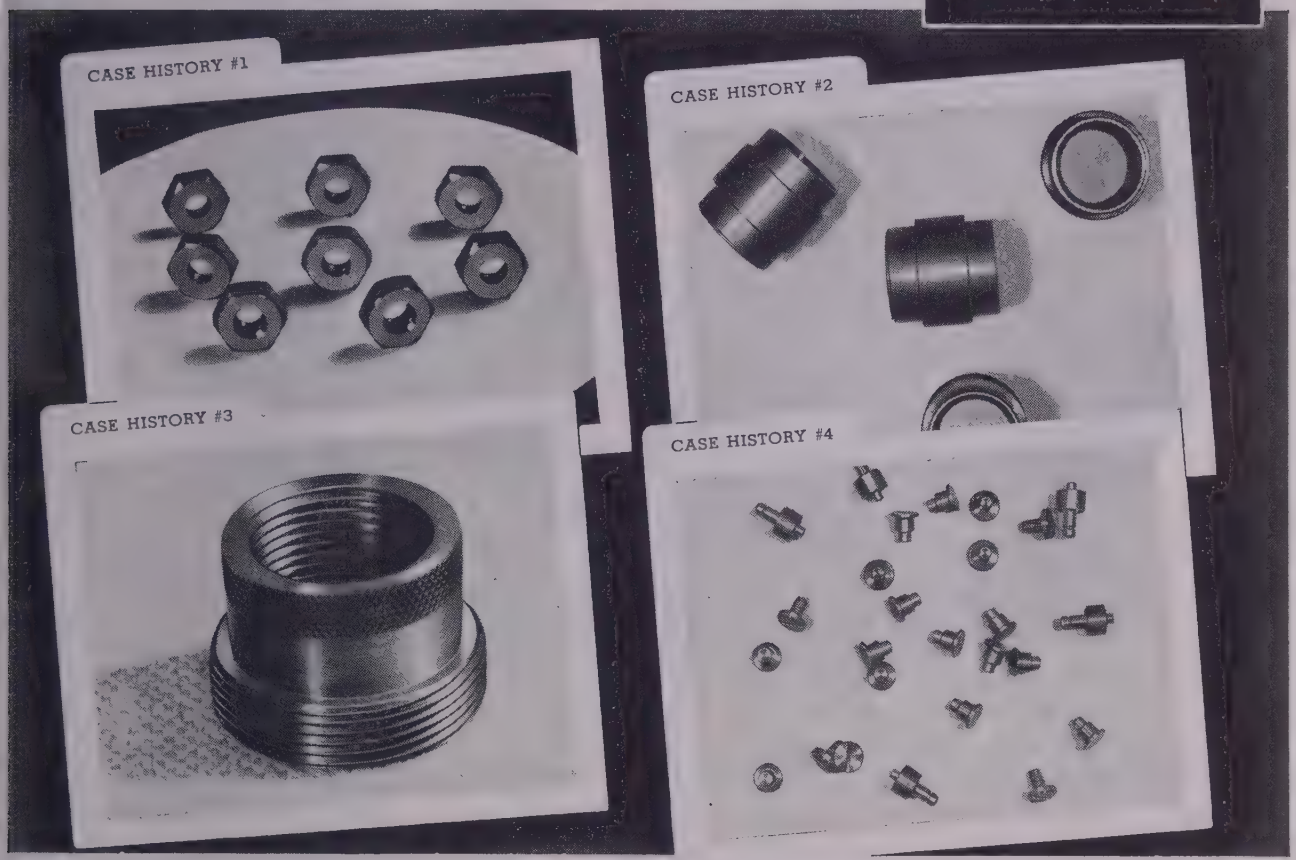

Four typical examples, taken from 100 case histories, show superior machinability of J&L "E" Steel.

For 4 years before "E" Steel was publicly announced, this new, free-cutting bessemer screw stock was tried by independent machine shops throughout the metal-working industry.

More than 6,100 tons were tested in over 100 applications!

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CASE HISTORY #2 ". . . tool life increased up to 200% . . . uniformity of finish remained constant . . . considerably increased speeds without sacrifice to finish."

CASE HISTORY #3 ". . . tool life increased two to four times . . . we were able to tap 1" full internal pipe thread, almost impossible on regular material."

CASE HISTORY #4 ". . . new steel machines very well . . . finish excellent . . . tool life increased . . . 5 to 10% better production."

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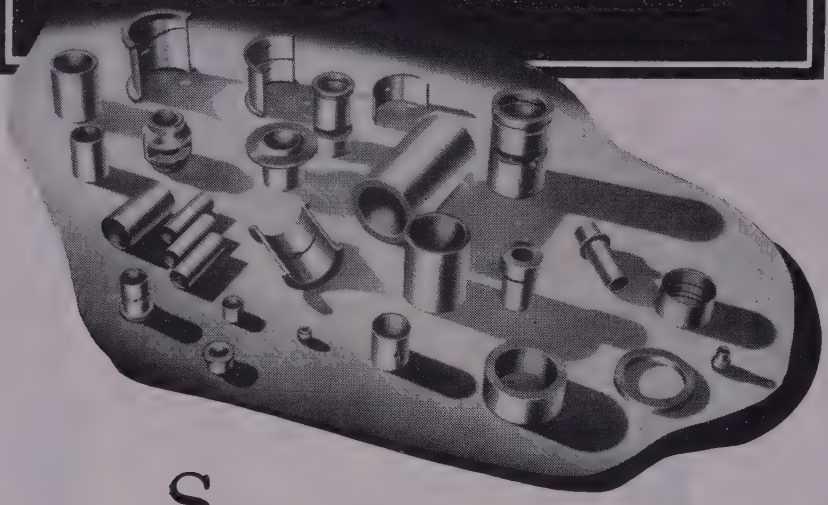

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SLEEVE BEARING HEADQUARTERS
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liveries are extended 6 to 8 weeks on galvanized, enameling and plain cold-rolled sheets. Some improvement also is noted in demand for silicon sheet and strip due to increase in small motor requirements, but prompt mill shipment still is available as is the case in plain hot and cold-rolled strip and hot-rolled sheets. Sheet requirements from builders of heavy trucks, farm implements and furnaces remain restricted by reduced output of these items and inventory retrenchment policy followed by metalworking concerns in the industries. Prospect of a cessation of steel mill operations in September due to strike has prompted little forward buying to date among miscellaneous steel consumers. Automotive interests have relatively large stocks and have not yet begun to cut-back on specifications due to continued bright demand outlook for industry's product. There is less comment among consumers as to prospect of lower steel prices, a factor which previously contributed to more conservative buying policy among metalworking concerns.

Cleveland—Republic Steel Corp. reduced handmill silicon sheet prices Aug. 9 to competitive levels. The reductions, in each case amounting to $10 a ton, set new prices as follows: Armature grade, $5.45 per hundred lb; electrical grade, $5.95; and special motor, $6.70. Prices on silicon coil stock remain unchanged.

As a result of some pickup in home appliance production, producers of fractional horsepower electric motors are back into the market for silicon. Some of these silicon consumers had been out of the market 120 days.

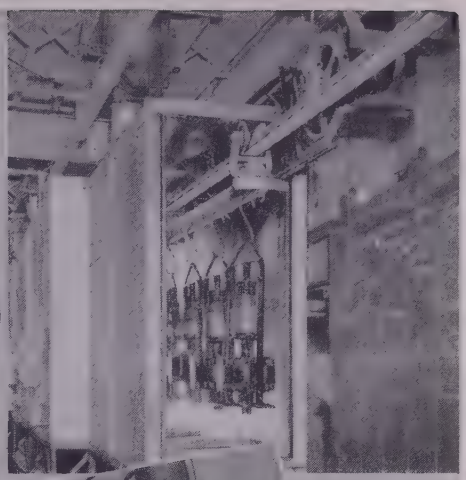
Demand for flat-rolled carbon products has strengthened substantially, Republic Steel reporting order volume now 2½ times greater than in early July. As a result, new orders are in excess of tonnage being shipped. A substantial portion of this upsurge stems from the auto industry's move to accumulate sufficient steel to carry through a possible steelworkers' strike. However, steel salesmen were finding more long-term encouragement over new ordering from appliance manufacturers and other consumers who have completed their inventory reductions. Evidences of completions of inventory reductions are requests for quick delivery on new orders.

Cincinnati—Volume of sheet buying is unchanged, and continues adequate to keep mill schedules fairly well filled. Prospects for September are at least as good as those for August. Sentiment in the market is more optimistic. Fabricators who had large inventories are asking for rush shipments on materials to balance stocks, and there are inquiries from customers who withdrew from the market several motnhs ago. Demand continues dull for stainless and siilcon sheets.

Chicago—Indicative of the pickup in demand for sheets and strip, one local producer is booked solidly into late October. Not only are automotive interests pressing for tonnage, but consumers in other fields are more active, notably household appliance and farm implement makers. How much is due to inventory building prior to Sept. 15 and

Armatures are dipped into varnish by use of a tramrail drop section which later is raised permitting carrier to travel forward.

After draining, armatures are advanced to oven. Carriers are traveled slowly through oven by motor-driven chain drive.



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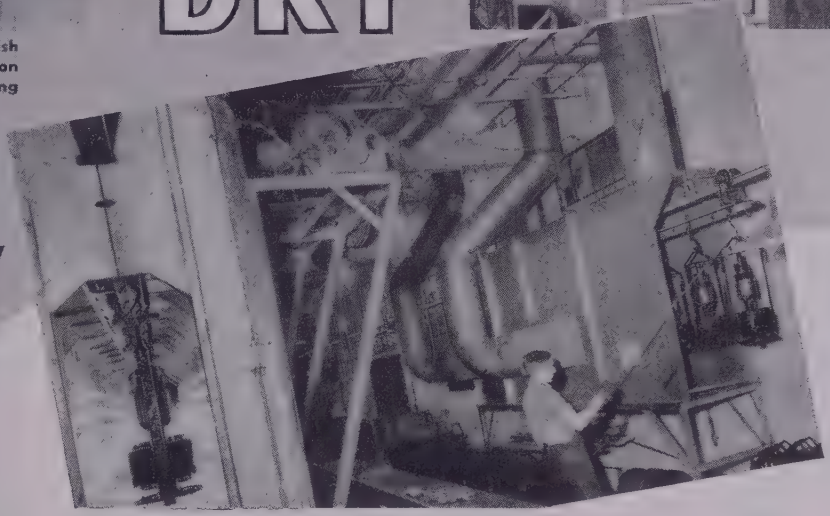
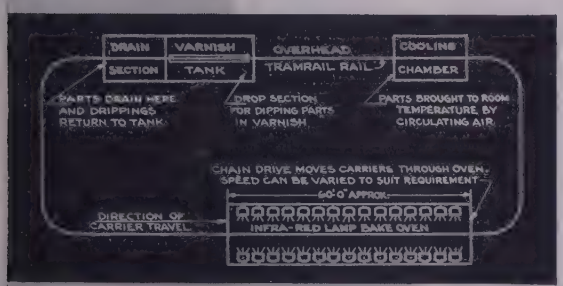


In cooling chamber armatures are cooled to room temperature.


DRAIN SECTION
VARNISH TANK
OVERHEAD TRAMRAIL RAIL
COOLING CHAMBER
PARTS DRAIN HERE AND DRIPPINGS RETURN TO TANK
DROP SECTION FOR DIPPING PARTS IN VARNISH
PARTS BROUGHT TO ROOM TEMPERATURE BY CIRCULATING AIR
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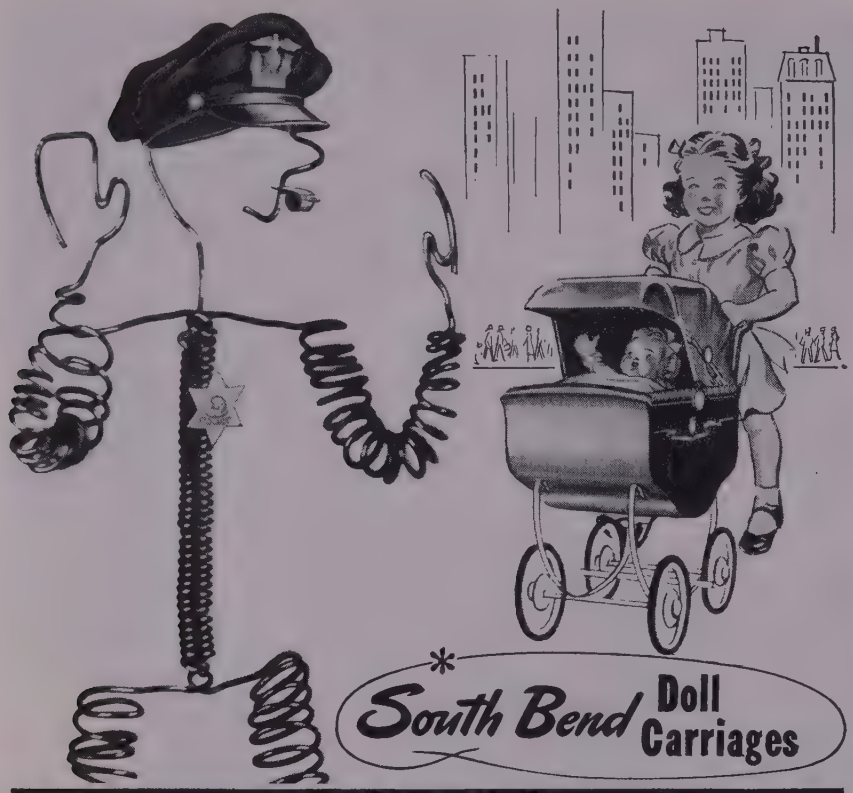

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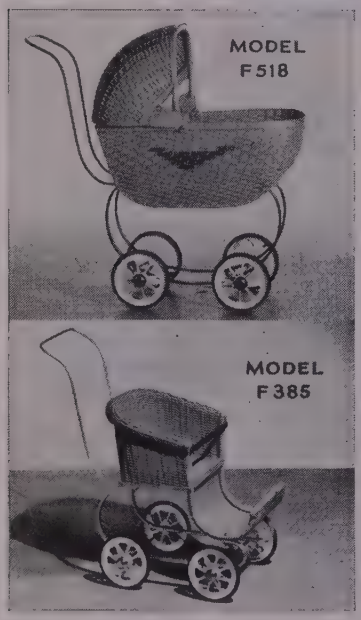

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how much to improved operations is difficult to determine. Conversion steel is virtually out the window with consumers seeking material from normal mill sources and this is another uplifting factor. Mills now find it necessary to place more emphasis on customer quotas. Coated products are extremely tight.

St. Louis—Sheet demand has taken a little spurt. Fabricators, whose inventories dropped dangerously, are returning to the market for prompt shipments of moderate tonnages. With these needs met, mills predict another drop in September, when local consumers' stocks generally will have reached bottom. They consider the October outlook promising and believe it may continue so throughout the fourth quarter. Cold-rolled sheet customers anticipate substantially better orders in that period. July shipments of sheets in this district were about equal to those in June.

Los Angeles — Sheet demand is much stronger than it has been in many months. Mill deliveries generally have been extended to 90 days, with one major producer booked solidly through the fourth quarter. Corrugated sheets and light gage galvanized are in exceptionally tight supply. Requirements of domestic water heater manufacturers for black sheet for galvanizing have revived strongly after being in the doldrums since early this year.

San Francisco — Although generally consumers continue to buy flat-rolled products on a hand-to-mouth basis, some slight pick-up in demand is noted. Users show little tendency to stockpile against possibility of a strike.

The largest sheet producer in this area is operating his mill at capacity.

Steel Bars . . .

Bar Prices, Page 144

Pittsburgh — Alloy bar producers are confident inventory adjustment among major consumers has about run its course and anticipate moderate improvement in new order volume for replacement purposes by early September. Automotive interests have increased specifications to get orders on mill books for completion of current models and as hedge against possible industry-wide strike in September. This situation is reflected in stepping up of electric furnace and open-hearth operations among specialty steel producers in recent weeks. Cold finishers and merchant carbon bar interests similarly anticipate gradual improvement in new order volume over coming months.

New York—Bar deliveries continue easy and, while there is a small pick-up in demand at the moment, indications are that there will be no stringency in any grade or specification for some time to come. In fact, sellers are keeping their fingers crossed with respect to automotive requirements over the remainder of the year. Most auto makers and many of their suppliers have bought in excess of needs as a protective measure in the event of a steel strike. Should such a strike fail to materialize, there is a strong possibility of

fairly important cutbacks next month, particularly since actual needs of the automobile industry may shrink in the final quarter due to an expected decline in business. Even as matters now stand, most sellers of hot carbon bars can promise delivery within three to four weeks on most specifications. Sellers of cold-drawn bars can do even better because of the rounded position of their inventories. Hot and cold alloy bars also can be had for fairly prompt shipment.

Boston—Improvement in bar orders is slight with delivery and freight costs prominent factors in placement of business. Order backlogs are light and shipment within two to three weeks is possible on a broad range of carbon and alloy material. Cold finishing operations by district mills are substantially below earlier levels and shipment from stock is possible on a wide range of sizes and grades. Although a few bar consumers, including one or two forge shops, are working off more tonnage, inventories generally are still substantial.

Philadelphia—Hot carbon bar mill deliveries can still be had within two to three weeks. Practically all producers have little in the way of backlogs and not infrequently tonnage can be delivered from stock, such as is even more generally true in cold-drawn and alloy bars. Outlook is for little immediate tightening in supply; in fact, should the wage controversy be settled peacefully, there might even be cutbacks in contracts which would make for an even softer situation temporarily. However, except for the automotive industry, it appears doubtful that there has been much protective covering.

Wire . . .

Wire Prices, Page 145

Boston—Demand is slightly more active. More users have reduced their inventories to the point where they must resume limited buying. Mild improvement is spread over a considerable range of products on which prompt delivery is usually asked with forward buying slack. Cold-heading stock releases against deferred orders have perked up mildly. Rod supply is ample to cover demand for both high and low-carbon grades. Finishing mills have attained the best balance in their tonnages of semfinished materials since prewar.

New York—Wire consumers are becoming more concerned over the possible effects of the wage controversy and are asking for an increasing amount of steel for delivery prior to Sept. 15. In most instances, wire makers are in position to comply with these increasing demands for nearby shipment.

Pittsburgh — Jobbers' stocks of merchant wire products, with exception of nails, are largest and in better balance than at any time in postwar period. Distribution of all wire items is no longer on a mill allotment basis, with most sellers in position to make deliveries within 2 to 4 weeks. Automotive requirements for cold-heading stock have improved moderately, but this is the only

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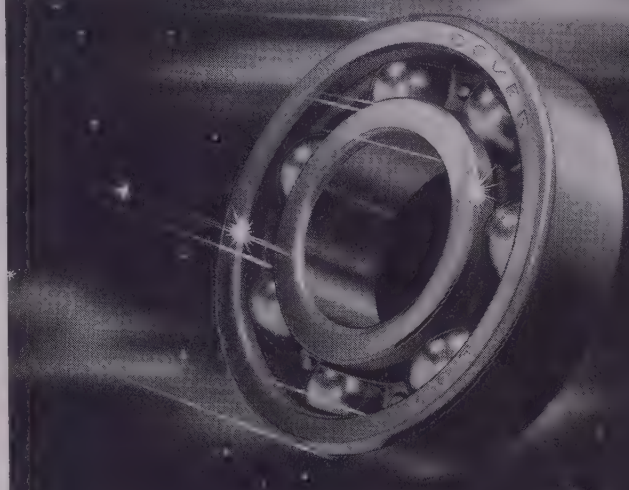

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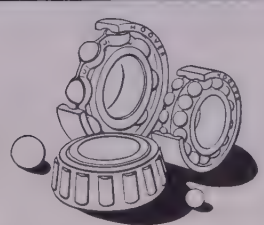

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bright spot in an otherwise depressed market. Customers' specifications do not appear to be influenced by possibility of a steel strike in September, indicating inventory retrenchment is not completed in many instances.

Crawfordsville, Ind. — Mid-States Steel & Wire Co. is quoting low-carbon manufacturers' wire 4.30c per pound; merchant quality wire, 6 to 8 gage, 4.95c annealed and 5.40c galvanized; woven fence, 9 to 15½ gage, column 112; single loop bale ties, column 109; stock nails and staples, column 106; barbed wire, column 126. The company is equalizing freight from its Crawfordsville, Ind., mill with other producing points.

Plates . . .

Plate Prices, Page 145

New York — While plates have shared in the mild improvement in general steel business most plate sellers are greatly in need of business and can make shipments within two to three weeks, notwithstanding continued curtailment in operations.

Some of the recent improvement has been seasonal, particularly the livelier demand from fabricators of fuel oil tanks and heating equipment. However, in most major lines, such as railroad and shipyard requirements, business continues spotty, with little early improvement in prospect. Building construction is contributing to a slight betterment, at least as compared with a month ago.

Most eastern plate makers are rolling on schedules ranging from two to four days a week, although the average is somewhat better than last month when there were various suspensions for vacations. Prices are unchanged.

Boston — Individual plate orders generally are small and buying is marked by an absence of forward commitments. While sheared plate deliveries are being promised for September in some instances, universal plates are available in two to three weeks, frequently by truck. As bulk of buying appears to be for filling openings in inventories and is geared closely to actual consumption, delivery is the major factor in placement of orders and is more frequently made by truck. Tank shops are watching costs closely with competition keen for fabricated work. This has lowered prices for finished products in most instances.

Philadelphia—Plate backlogs are particularly light. While one leading eastern producer is booked up through the remainder of the quarter, this is a highly notable exception, because the rank and file of eastern plate sellers are now having to scratch for tonnage as they have not done in a number of years. Most district plate mills have been rolling around three days a week on an average, with ingot operations substantially curtailed. Most plate mills can make deliveries within two to three weeks and even less in some instances.

Lack of specifications from railroads and shipyards is keenly felt, and the cancellation of contracts for construction of two tankers at the Sun yard, Chester, Pa., has tended

o further dim the outlook for ship onnage. Oil and gas requirements, ong a major plate item in construcion work, continue to lag, although here is a little pick-up in small fuel il tank and boiler demand.

Los Angeles—Supplies have eased n virtually all plate categories, and mill deliveries now range from 60 to 0 days. Nevertheless, requirements of the petroleum industry and heavy pipe fabricators continue in good volume, and greater numbers of construction projects are coming out in substantial tonnages. Los Angeles Department of Water & Power, which has a number of jobs under way, has just received bids on one tunnel liner involving 500 tons of plate.

Seattle—Plate shops report a lack of business and disappearing backlogs. Inquiry is slow and prospects not promising. Materials are now in ample supply.

Tubular Goods . . .

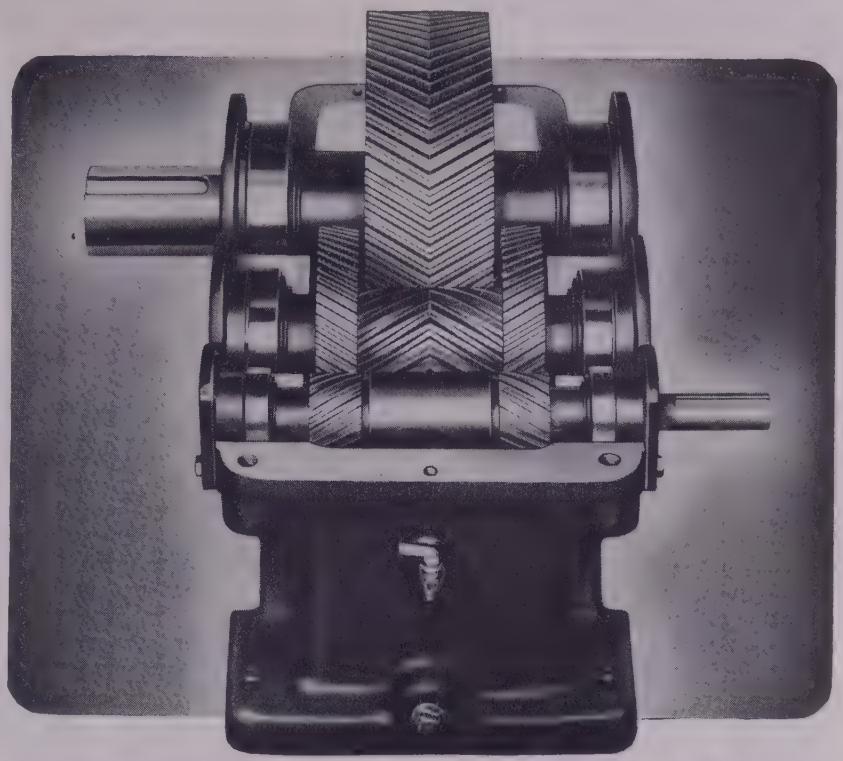
Tubular Goods Prices, Page 145

Pittsburgh — Output of seamless pipe exceeds new order volume, allowing mills to reduce order backlogs which extend into 1954 for large size classifications. Producers are caught up with demand for butt weld and are channeling some output into mill warehouse stocks which were substantially depleted prior to July 16 when a strike threatened. However, distribution of butt weld remains on a mill allotment basis. Some jobbers have passed up accepting August quotas for butt weld, but resultant slackening in demand has been taken up largely by other jobbing outlets. Demand for mechanical and boiler tubing has recorded little change with sellers in position to offer prompt shipments.

Philadelphia — Merchant pipe demand is brisk, reflecting considerable activity in plumbing lines, actually more than was anticipated earlier in the summer. Line pipe work is fairly active, although demand for oil country goods is slack, with one district producer having suspended operations entirely. Somewhat ironically, this interest was greatly handicapped during the steel stringency in booking new business because of the lack of skelp; now that skelp is readily available, there is a sharp falling off in demand for oil country pipe. Worth Steel Co.'s Claymont, Del., mill is suspending its line pipe operations this week during the installaton of additional equpment.

Los Angeles—Although pipe and tube supplies have eased considerably, demand remains good. This is particularly true of domestic construction items, new home building in Southern California being exceptionally active again. Requirements of the petroleum industry also are being well maintained, with refineries and petroleum products facilities ranking No. 1 in the Los Angeles area for expenditures on plant expansions during the first half of 1949.

Seattle—Inquiry for cast iron pipe continues slow, alternatives offering stiff competition. Little improvement is anticipated during the balance of the year.



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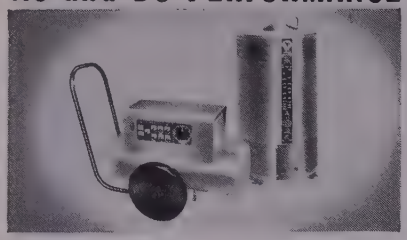

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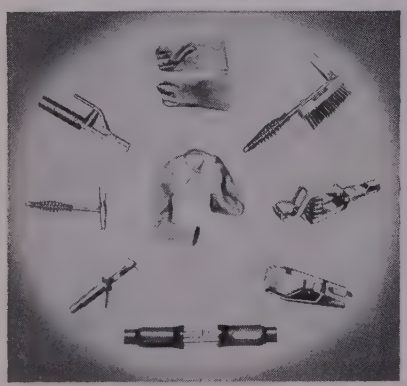

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Structural Shapes . . .

Structural Shape Prices, Page 145

New York—An increasing amount of public work, particularly bridges, is the chief cause for an overall improvement in structural demand. Some fabricators note a smaller gain in private inquiry. Pick-up in business over the last three or four weeks has not been sufficient, however, to offset fabricators' receipts from mills. Most shops report a further reduction in backlogs, though in most cases they have a fairly comfortable supply of work on hand, notwithstanding continued evidences of sharp competition.

Boston — Inventories of standard structural shapes held by fabricating shops are well balanced. Bulk of buying is for wide flange sections. District shops are behind delivery schedule on orders for plain material accumulated during an eight-week strike at their shops. New inquiry is featured by two bridge projects in Maine and one in Boston.

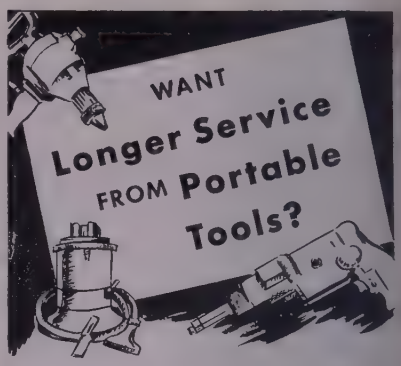
Philadelphia — Structural activity is being further dominated by public work, especially for the state of Pennsylvania. Several new jobs, involving some sizable projects, are up for bidding, both for the Turnpike and State Highway commissions. At least three fair sized awards for such construction have been placed recently with one eastern fabricator. Private work is light. Except for wide flange beams, shapes can be had for shipment within three weeks. Wide flange material is available within five to six weeks.

Buffalo—A contract for about 12,000 tons of structural steel has been awarded to the Bethlehem Steel Co. by the Ford Motor Co. for a new stamping plant on a site adjacent to the Bethlehem Lackawanna plant. The local Bethlehem plant is turning out framework for the huge addition to the local Bethlehem strip mill.

Los Angeles—Although structural competition is severe, demand is stiffening somewhat. With the flow of industrial projects growing from what had been a mere trickle for several months, fabricators and steel constructors are having to place less dependence on public works. Engineering construction awards in southern California, southern Nevada, and Arizona, during the first seven months of 1949 totaled $93,523,883, representing a 2 per cent increase over last year. On a seasonally adjusted basis, July's total was the second highest for that month in history, being exceeded only in July, 1941.

San Francisco — Plentiful supplies of structurals coupled with restricted demand have increased competition sharply. Producers and jobbers, eyeing a number of new projects scheduled to get under way soon, hope for an autumn pick-up. Meantime, about $75 million of building projects in this area have been stymied by a strike of teamsters employed by cement mixing plants.

Seattle — Structural steel inquiry has declined and order backlogs are being absorbed. Small projects predominate, no outstanding project being up for figures. Materials are plentiful.



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Quotations advance $2 a ton on steelmaking grades in Chicago district

Scrap Prices, Page 150

Chicago — Lack of substantial crap buying still characterizes this market, but sufficient tonnage has moved to establish a $2 higher price level on steelmaking grades. There is considerable doubt that this level could be held down should mills undertake even moderate buying. Dealer grades are not moving and brokers continue to sit tight awaiting further development of the pattern, but the situation is definitely stronger than it has been for several weeks. Last week, however, a local steelmaker paid $17 for short shoveling turnings, this boosting turning and boring grades except for mixed. While yards are accumulating some material currently overall supply appears to be short. Railroads once more are receiving prices higher by $5 or $6 for their offerings.

New York — Stronger undertone prevails in scrap. While brokers have made no further increases in their buying prices for the major open-hearth grades, they have stepped up offerings on machine shop turnings and mixed borings and turnings to $5-$5.50, f.o.b. shipping point, and on short shovel turnings to $6.50-$7. They also are offering more for punchings and plate scrap and cut structurals, the market now holding at $16.

Brokers' buying prices on No. 1 cupola and No. 1 machinery cast have been advanced to $21-$22 and $22-$23.00, respectively. Charging box and heavy breakable cast are higher at $19-$19.50.

Philadelphia — Scrap market is featured by higher prices in cast grades and by stronger undertone in steel grades. However, the latter is not occasioned so much by consumer buying, which still remains spotty, as by increasing seller resistance. Some brokers now are having to pay more to yard men and collectors for steel scrap than they actually contracted to sell it for only recently. Mills generally, though, are showing little real interest in scrap and probably will not until at least after the wage controversy is settled. In practically all cases, consumer inventories of steel scrap are substantial. At one large consuming unit, stocks are estimated as being in excess of three months' supply on the basis of normal operation.

Shipments of German scrap are now about at an end. One large eastern consumer finished the unloading of cargo at Philadelphia a few days ago and is expecting a cargo at Baltimore this week, which will be the last for this interest, it is understood.

No. 1 cupola cast is now holding at $26-$28, delivered; No. 1 machinery, $28-$30; charging box and heavy breakable, $24-$25; clean auto cast, $28-$30; and No. 1 wheels, $29-$30. Bar crop and plate are now $20.50-$21.50, delivered; punchings and plate scrap, $21.50-$22; and cut structurals, $20.50-$21.50. Machine shop turnings are $12; short shovel turnings, $13.50; mixed borings and turnings, $12.

Boston—Steelmaking scrap prices have advanced, reflecting firmness in other major districts rather than any substantial increase in activity in New England. Higher prices are more marked on heavy melting scrap, No. 1 bundles and busheling than they are on lighter grades. Among cast grades, heavy breakable is inclined to lag behind others.

Detroit — An amazing degree of optimism has developed throughout the scrap market and, while mills profess to be uninterested in purchases, strong broker support has driven prices of all steel grades up $1 a ton. Blast furnaces are buying borings and the entire turnings market has leaped $1.50 a ton. Meanwhile foundry buying of cast material has spurted, with prices advanced $4 a ton, No. 1 cupola grade now bringing at least $26. A local radiator foundry has been ordering heavily and frequently. At first it was believed the accelerated buying of No. 1 bundles at $2-$3 over published prices was merely short covering of a temporary nature, but general bullishness has not subsided and a price increase throughout the list is amply justified.

Buffalo—Pronounced strength was in evidence in the scrap market last week as prices moved ahead $1 to $5. The advance was substantiated

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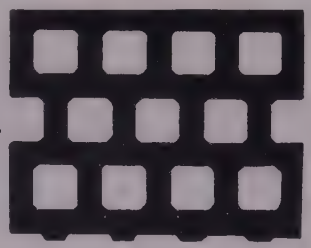

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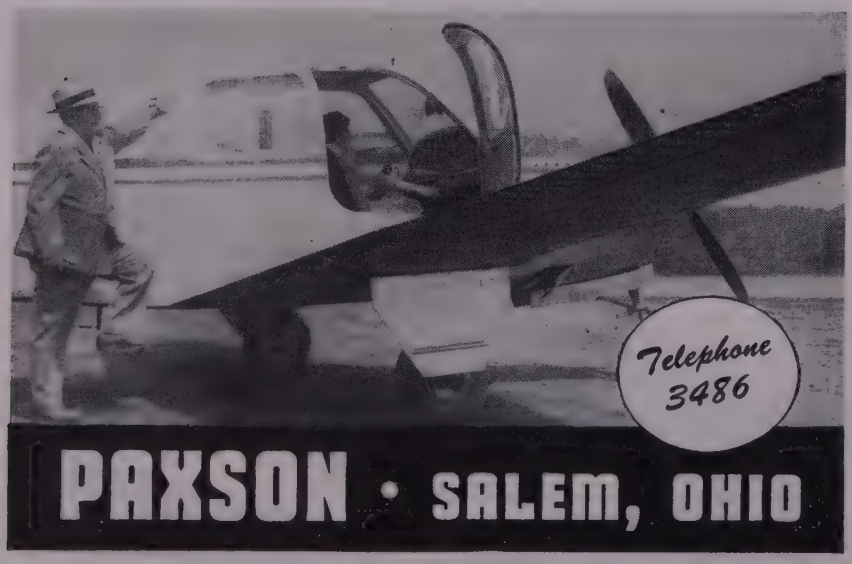

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by the fact that dealers were refusing to do business at bids within the advancing ranges.

No. 2 heavy melting and related items jumped about a dollar with dealers generally reluctant to recognize consumers' bids within the advance range of $20-$20.50. Cast material again showed the strongest tone with bids ranging as high as $5 above a week previously.

Eastern scrap continues to arrive here via the Barge Canal. Two fleets carrying about 5500 tons docked at the canal terminal where the cargo will be transshipped into Canada.

Pittsburgh — Speculative broker purchases of railroad scrap at substantially above previous quotations, plus necessity to pay up to $23 for No. 1 industrial heavy melting to cover short commitments at the $21 level, were major market developments last week. Brokers generally believe the low point in the downtrend has been reached. Some trade authorities, however, contend there has been no change in steel production outlook to warrant heavier purchases by the mills. There is no assurance finished steel demand will support current ingot operations, even if a strike is averted. At least a portion of the slight upturn in mills' bookings is due to precautionary buying on the part of consumers. As long as major scrap consumers remain out of the market for significant tonnages, there is no real basis for the reversal of the price trend in heavy melting scrap. Higher price levels in other districts make it possible to deliver No. 1 heavy melting here from remote points for $21. Crushers claim they are forced to pay up to $15 for machine shop turnings and mixed borings. At least one mill has purchased short turnings at $17.50. Cast grades are higher priced on revival of foundry purchases.

Railroad scrap quotations are based on awards to brokers at prices ranging between $1 to $3.50 a ton above previous quotations.

Cincinnati—Scrap prices are moving higher, even though buying is restricted. Influence for the rise came from higher bids on railroad lists, more active market in nearby districts for cast, and drying up of dealer tonnage. No. 1 cupola cast is only $1 higher at $28, but random length rails shot up $4 to $25 on basis of recent bidding.

Cleveland—Activity in the scrap market is confined largely to filling of old orders on which steel mills had previously requested delayed delivery. The recovering rate of steel production is consuming an increasing tonnage of scrap but the mills still have good inventories and with a steelworkers' strike threatened there is no inclination to step into the market for big tonnages.

Low level of foundry activity holds down demand for cast grades.

St. Louis—Scrap prices have advanced briskly with steelmaking grades up $2 to $4 and cast $2 to $6. Low inventories plus sparse offerings have launched a sharp rebound from the oversold condition of the scrap market a month ago. Country shipments have practically vanished with collectors awaiting anticipated higher prices. Economy reductions in railroad maintenance forces have trimmed rail offerings,

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with the result those prices rose when mills found the supply of dealer scrap short. Little mill buying is going on, however, and inventories are down to perhaps 45 days. Foundry stocks, down to the 10-day mark, have created good demand for cast scrap. No. 1 cupola is quoted at $30-$31, compared to $24-$25 a month ago. Foundry buying is strictly on a hand-to-mouth basis to replenish stocks. No general pick-up in orders is reported except in seasonal industries like stoves. Scrap dealers expect a new price bulge in September.

Los Angeles—Dullness continues to mark the scrap trade here. Mills are buying little, but are becoming increasingly more selective in the tonnages they do accept. Mill buyers generally want no galvanized or black bales, and are concentrating on Nos. 1 and 2 heavy melting steel. Foundry demand is slow for both electric furnace and cast material, although one foundry, which is in large-scale production of man-holes for sewerage systems and catch-basins for freeway projects, is active. Rerolling rails are up $2.50 to $25 a gross ton.

San Francisco — Although prices of scrap have dropped again, mills show no tendency to enter the market for large tonnages. The little buying being done is on a highly selective basis. No. 1 heavy melting has been cut from $20 a ton to $17; No. 2, from $18 to $15; Nos. 1, 2 bundles, from $16 to $13. Cast iron grades are also weaker. No. 1 cupola cast is now $23 to $25 a ton.

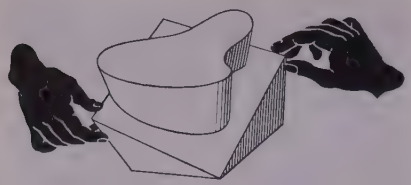
Seattle — Steel scrap market dropped $1 on Aug. 1, mills now paying $16 for No. 1 and No. 2 heavy melting, $13.50 for No. 1 bushelings, $14 for No. 1 and No. 2 bundles, $11 for borings and turnings and $23 for clean auto cast. No. 1 cupola cast is quoted at $20-$22. Mills are receiving as much material as they desire and inventories are not being increased. Buyers absorb 50 per cent of freight from outside points, and are now in position to insist on high grade material. Some scrap is coming from British Columbia, well prepared and select. Duty is 37.5 cents but buyers pay in U. S. dollars more than offsetting this expense.

Bolts, Nuts . . .

Bolt, Nut, Rivet Prices, Page 145

New York—Some slight improvement is noted in demand for bolts and nuts. This is ascribed to a desire on the part of buyers to increase stocks. In some instances, inventories have been allowed to run extremely low.

Nut and bolt manufacturers report a continued reduction in their backlogs, barring a slight improvement at the end of last month, due primarily to vacation shutdowns at many producing plants which were not offset fully by shutdowns at a number of consuming plants. Most makers look for a continued shrinkage in backlogs this month. Some makers' order bookings average around four or five weeks on miscellaneous business, with automotive and agricultural equipment orders being somewhat more extended.



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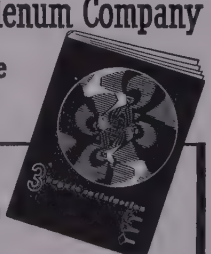

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Warehouse . . .

Warehouse Prices, Page 147

Pittsburgh — Distributors anticipate only slight improvement in shipments from stock this month with customers restricting orders to cover only immediate needs despite threat of a strike in September. Absence of an upturn in demand for warehouse steel following conclusion of mass vacation shutdowns in many metalworking plants indicates consumers still intend to follow an inventory retrenchment policy. Jobbers are placing mill orders on a selective basis in effort to reduce excessive stocks of alloys, stainless and other items. Warehouse inventories of galvanized sheets and wide flange beam are still inadequate to meet current requirements. Some distributors expect supply of these items to be in balance with demand by close of current quarter.

Philadelphia—Warehouse business is decidely spotty, with some leading distributors now doubtful if August trading will exceed that in July. There are still quite a few suspensions at consuming plants for vacations and, while inventories at various plants are being worked off, there is no great pressure on jobbers for fill-in tonnages because reasonably early shipments can be had on most products from the mills direct and buyers can afford to wait.

New York—Following some improvement in warehouse demand during the first week of August, business has slowed up again, according to leading distributors. Some doubt if August trading will surpass that of July, but they admit it is still a bit early to draw definite conclusions.

Cincinnati—Warehouse sales have leveled off and are now near the volume booked in July. Such tonnage, considered fair by prewar standards, is perhaps 50 per cent under that moved early in the year. Jobbers are experiencing a sharp drop in demand from coal mines, due directly to effects of the short week.

Los Angeles—Jobber activity generally is holding at a steady level, although one major warehouse reports its orders have increased greatly in number during the last few weeks. Inventories still are far from the desired balance, with heavy over-supply in some items, and marked shortages in others. Corrugated sheet, light gage galvanized, and some structural products, remain tight.

San Francisco — Jobbers report a few signs of better buying, but overall demand continues to lag. The warehouse union strike here continues, and about half the steel warehouses in the city remain closed.

Seattle—Jobbers' business in August has been better than that of a month ago. Demand is more sustained. Price structures are unchanged. Sale of surplus materials by shops and fabricators, under jobbing prices, is a disturbing factor, one local firm offering 1500 tons of shapes at reduced prices. Hot and cold-rolled items are in good supply, but galvanized sheets continue in short supply. Wholesalers hope to have complete stocks by Oct. 1.

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Pig Iron . . .

Pig Iron Prices, Page 146

Pittsburgh—Merchant iron requirements continue considerably less than output, resulting in a steady increase in stocks at furnaces. Vacation shutdowns among most foundries have been concluded without the hoped for revival in pig iron buying. Apparently many interests are still working off inventories which are still excessive in relation to projected production schedules. Some foundries remained closed due to lack of orders. Current price levels are not expected to be tested until buying improves. Sellers claim they would not be able to sell much additional iron in the present market, even if prices were substantially lower. An additional factor in this connection will be the outcome of wage contract negotiations.

New York—Foundry melt is still hampered by excessively warm weather. However, most pig iron sellers expect August consumption of iron to be slightly higher than last month, at which time the vacation season was at its peak. Nevertheless, such gain as may be seen this month and in the next few months to follow, is not likely to tax production facilities. Furnaces are still stock piling and will probably continue to do so for some time to come.

Boston—While shipments of pig iron this month are slightly heavier than those in July, the increase has been disappointingly small thus far. This reflects the slow recovery in melt and lower operations by basic users after vacation shutdowns. Many smaller foundries have meager inventories of iron, but until orders for castings appear in larger volume releases will continue limited. The Mystic furnace at Everett, Mass., is gradually building up its stockpile, but that furnace may operate through September.

Philadelphia — Pig iron producers are moving foundry iron at a somewhat better rate than last month, especially to the pipe foundries. However, basic buying still lags, as ingot production continues to sink in this district, and all-in-all pig iron shipments show little, if any, gain. Producers throughout the East are still piling iron and will likely continue to do so well into the fall at least, unless there is some major labor disruption.

Buffalo — Mixed tendencies are noted in the merchant pig iron trade. Some sellers report the recent flurry in buying was due, in least in part, to consumers building up stocks in the event of a steel strike. As a result, August deliveries have slipped in some instances. On the other hand, the American Radiator & Standard Sanitary Corp., which suspended production here on June 30 because of an excessive inventory position, will resume operation at its Bond plant Aug. 15. It will revive operations in its two foundries, the one making boiler sections and the one on plate work. Its subsidiary, the Tonawanda Iron plant, is expected to relight its idle blast furnace in the near future. An improvement in orders was also reported by the Buffalo Foundry & Pipe plant, which

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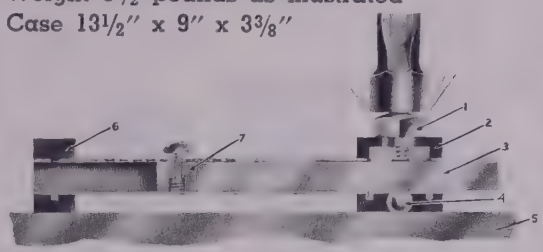

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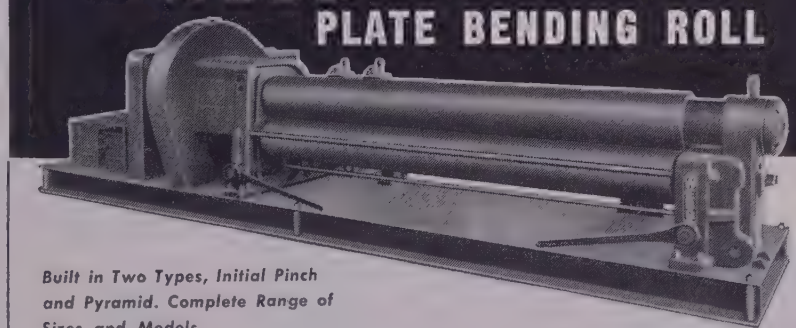

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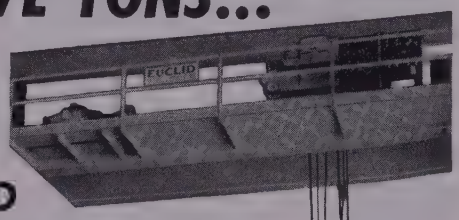

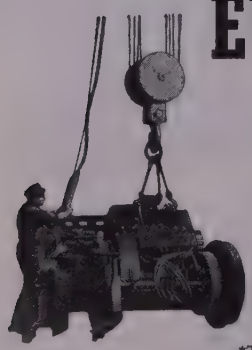

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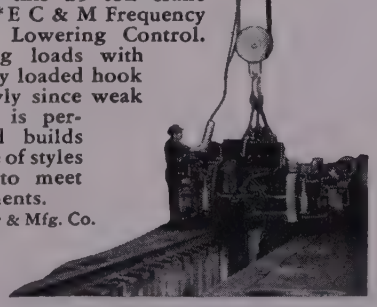

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has been on a four-day week. The Hanna Furnace Corp. says work has started on its program of modernizing blowing equipment in its four blast furnaces here. The program will cost about $200,000.

Cleveland — Optimism over business prospects is increasing in the foundry and pig iron trade but it has not generated any appreciable amount of new demand for iron. Foundries continue on a short workweek. Under the present cautious buying policy of industry, buyers want immediate delivery on castings, and being short of business, foundries push hard to comply with the request.

Because of the low level of demand for foundry iron, Republic Steel Corp. last week banked a Cleveland blast furnace which had been producing merchant iron.

Cincinnati—Foundry melt is showing some signs that it may be headed slightly upward. Pig iron shipments are no heavier, but suppliers believe the bottom of the slide was reached in July when the drift was accelerated by vacations. An occasional reentry into the market for iron and for coke is noted. Melters on automotive castings see no slackening.

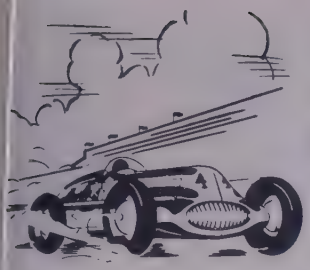
St. Louis — Pig iron demand is showing moderate pickup but is still far from sufficient to justify capacity production. Koppers has had one of its two furnaces banked more than two months, holding output to about 60 per cent, with no prospect of early resumption of capacity operations. Increased pig demand originates principally from the stove and farm equipment industries and hence is considered seasonal. A number of foundries, however, have worked inventories down to rock bottom, especially high-priced iron acquired during the scarcity period, and are beginning to restock in anticipation of better fourth-quarter orders for castings. Foundries are fighting hard for new business and a few are meeting with success, although no general pickup is in sight. Strengthening scrap prices also are aiding pig demand. Consumers are still buying hand-to-mouth and local furnaces are maintaining 25,000 to 30,000 tons of ground stocks.

Dallas—Lone Star Steel Co. banked its blast furnace at Lone Star, Tex., on Aug. 8, reports George D. Ramsay, vice president in charge of operations.

Alloy Steel . . .

Cleveland—Additional buying by automobile makers to carry through a possible strke of steelworkers has strengthened demand for alloy steel. Increased ordering of alloy by machine tool builders also is reported.

The upturn in demand for alloy prompted Republic Steel Corp. to put on another open hearth at Massillon, O., last weekend. To produce alloy, Republic now has on five of its nine open hearths at Massillon, four of its six open hearths and six of its 12 electric furnaces at Canton, O. As part of this stepup in operations is due to protective buying by the auto industry, the company believes the increased level of alloy production may be only temporary.



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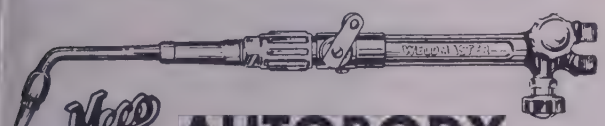

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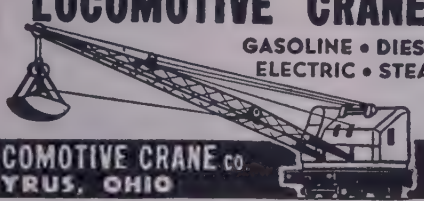

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Metallurgical Coke . . .

Metallurgical Coke Prices, Page 146

Pittsburgh — Dearth of new orders and growing open market supply of oven furnace and foundry coke has forced Connellsville beehive coke operators to keep furnaces shutdown. There is no demand for blast furnace beehive coke, while requirements for foundry coke continue to lag despite conclusion of vacation periods. Steel producers and foundries reportedly have abnormally large coke stocks. Some oven furnace coke has been placed on the market during the recent period of depressed blast furnace operations.

Stainless Steel . . .

Stainless Steel Prices, Page 145

Cleveland—Demand for stainless steel has held up better than that for carbon steel. This sustainment is attributed to the widely diversified types of industries using stainless.

Rails, Cars . . .

Track Material Prices, Page 145

New York — Domestic freight car awards in July totaled 408 units, according to American Railway Car Institute, this city. Of this number, 208 were placed with car builders and 200 with railroad shops. Total for the first seven months, with revisions in some of the earlier monthly figures, due largely to cancellations, amounted to 3394.

July deliveries totaled 6434 cars, with production in June amounting to 9121 cars.

Order backlogs as of Aug. 1 were: Car builders, 18,609; railroad shops, 17,955; total 36,564. This compares with 42,813 on July 1 and 125,093 on Aug. 1, 1948.

Tin Plate . . .

Tin Plate Prices, Page 145

San Francisco—Demand from food canners is now reaching seasonal peak. Leading tin plate producer in this area is running at capacity. Tin can manufacturers are well supplied with material.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

800 tons, section of the Major Deegan expressway, Bronx, New York, through Johnson, Drake & Piper Inc., to Harris Structural Steel Co., that city.

250 tons, building, American (Guernsey) Cattle Club, Peterboro, N. H., to Berlin Construction Co., Berlin, Conn.; Morton C. Tuttle Co., Boston general contractor.

200 tons, Washington state highway bridge, to Poole, McGonigle & Dick, Portland, Oreg.; Manson Construction & Engineering Co., Seattle, general contractors.

150 tons, 7-story addition to Crescent store, Spokane, Wash., to Union Iron Works, Spokane; Henry George & Sons, general contractors.

100 tons, repairs to earthquake-damaged state Insurance building, Olympia, Wash., to Pacific Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

5340 tons, state bridge work, Westmoreland and Allegheny counties, Pennsylvania; bids Sept. 30.

2570 tons, state bridge over west branch of Susquehanna river, between South Williamsport borough and city of Williamsport, Pa. bids Sept. 9.

1500 tons, Pennsylvania turnpike sections 26-B, 26-C and 27-A, Berks and Chester counties; bids Aug. 31.

765 tons, state bridge, Arrowsic-Woolwich, Me.; bids Aug. 31, direct on steel, Augusta also 1900 linear feet steel piling.

600 tons, estimated, Public School No. 18, Bronx, New York; bids Aug. 23.

500 tons, Pennsylvania turnpike section 22-B, Daulphin county; bids Aug. 24.

365 tons, state bridge, Stillwater river, Orono, Me.; bids Aug. 24, Agusta; also 2960 linear feet steel piling, contractor letting.

325 tons, state bridge, Berks county, Pennsylvania; bids Sept. 2.

295 tons, Pennsylvania turnpike section, Cumberland county; bids Aug. 17.

150 tons, plant addition, Hercules Powder Co., Wilmington, Del.; bids Aug. 19.

140 tons, state bridge, Lancaster and Chester counties, Pennsylvania; bids Sept. 2.

Unstated, four fixed wheel gates, Hungry Horse dam; bids to Bureau of Reclamation, Denver, Sept. 1; sch. No. 2749.

Unstated, steel trolley beam and other items, Coulee power plant; bids Aug. 23; four radial gates, also hoists and other appurtenances, Columbia Basin, bids Aug. 30; oil purifier for Coulee power plant, bids Sept. 1, sch. No. 2753; all to Bureau of Reclamation, Denver.

PLATES . . .

PLATES PLACED

300 tons, (previously reported 200 tons) storage tanks for Olympia Brewing Co., Olympia, Wash., to Puget Sound Sheet Metal Works, Seattle.

PLATES PENDING

24,000 tons, oil pipeline, 320 miles, Salt Lake City, Utah., to Boise, Idaho, for Salt Lake Pipeline Co.; general contracts to Smith Contracting Co., Fort Worth, Texas, and Grafe-Callahan Construction Co., Los Angeles.

PIPE . . .

CAST IRON PIPE PLACED

300 tons, system improvement to Kirkland, Wash., to Pacific States Cast Iron Pipe Co., Provo, Utah.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Nashville, Chattanooga & St. Louis, six 1500-horsepower diesel-electric road switching engines and four 1000-horsepower diesel-electric yard switching engines, to the Electro-Motive Division, General Motors Corp., La Grange, Ill.

REINFORCING BARS . . .

REINFORCING BARS PLACED

664 tons, Mellon-United States Steel building, Pittsburgh, to United States Steel Supply Co., Pittsburgh.

500 tons, 14-story Decatur apartment house, Seattle, to Northewest Steel Rolling Mills Inc., Seattle; J. C. Boespflug Construction Co., general contractors.

500 tons, 400-bed Alaska Native Service Hospital, Anchorage, to Soule Steel Co., Portland, Oreg.; J. C. Boespflug Construction Co., Peter Kiewit & Sons, and Morrison-Knudsen Co., Seattle, low joint bidders, $4,612,354.

500 tons, Sovereign apartments, Brookline, Mass., to Truscon Steel Co., Boston.

475 tons, laboratory, Massachusetts Institute

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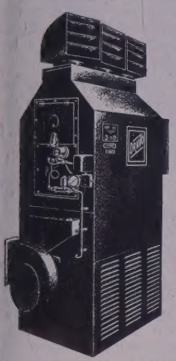

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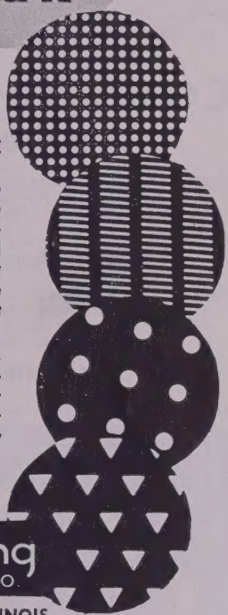

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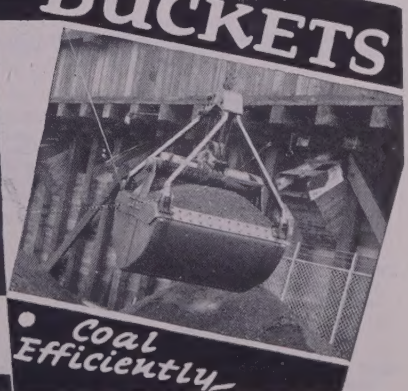

Coal Efficiently

of Technology, Cambridge, Mass., to Truscon Steel Co., Boston.

350 tons, new plant, Lincoln Electric Co., Euclid, O., to United States Steel Supply Co., Cleveland.

230 tons, Washington state bridge, Island county, to Bethlehem Pacific Coast Steel Corp., Seattle; Manson Construction & Engineering Co., Seattle, general contractor.

200 tons, miscellaneous small construction projects, to Bethlehem Pacific Coast Steel Corp., Seattle.

150 tons, Washington state bridge near Odair, to Bethlehem Pacific Coast Steel Corp. Seattle; Neill Lampson, Odair, general contractor.

REINFORCING BARS PENDING

848 tons, state bridge work, Westmoreland and Allegheny counties, Pennsylvania; bids Sept. 30.

499 tons, state bridge, Williamsport, Pa.; bids Sept. 9.

400 tons, state bridge, Salem, Mass.; Burke-Moore Co., Boston, low on general contract.

166 tons, state bridge, Berks county, Pennsylvania; bids Sept. 2.

CONSTRUCTION AND ENTERPRISE

ALABAMA

DOTHAN, ALA.—Hedstrom Union Co. will soon let contract for addition to its mill. Architect is Adolph Johnson, 39 Main St., Worcester, Mass.

ARKANSAS

NORTH LITTLE ROCK, ARK.—Visking Corp., A. G. Hewitt, vice president and general manager, plans to build a $1 million plant to house office and chemical laboratories.

CALIFORNIA

EAST LOS ANGELES, CALIF.—Lever Bros., 215 W. Sixth St., Los Angeles, has awarded a $25 million contract to Bechtel Corp., 3780 Wilshire Blvd., Los Angeles, for design and construction of a giant soap plant with auxiliary facilities.

PASADENA, CALIF.—California Institute of Technology, 1201 E. California Ave., has awarded a $450,000 contract to Ray Gerhart, 334 S. Greenwood Ave., for construction of a 3-story engineering laboratory

ILLINOIS

BELLEVILLE, ILL.—Belleville daily *News-Democrat,* Robert Kern, publisher, will receive bids on or after Aug. 15 on construction of an FM radio station, including a 1-story studios building, a steel transmitter tower, etc. Architects are Crowell, Mullgardt & Schwarz, 1620 Chemical Bldg., St. Louis.

BELLWOOD, ILL.—Sauerman Bros. Inc., 522 S. Clinton St. is erecting with local labor and separate contracts a $200,000 plant. J. L. McConnell — Associates, 53 W. Jackson Blvd., Chicago, designed the building.

CHICAGO—Bowman Dairy Co., 416 N. Whipple St., will build a $210,000 ice cream factory. Plans are by Leon F. Stanhope, 800 Davis St.

CHICAGO—Swift & Co., 7409 S. State St., plans plant additions costing $300,000.

CHICAGO—Great Lakes Spring Co., 7035 W. 65th St., has awarded a $245,000 contract to Clearing Industrial District, 38 S. Dearborn St., for a plant addition in the Clearing Industrial District.

CHICAGO—Vienna Model Bakery Inc., 701 S. Halstead St., has awarded a $230,000 contract to Welso Construction Co., 2345 S. Pulaski St., for erection of a bakery and garage.

EVANSTON, ILL.—Clayton Mark & Co., 1900 Dempster St., has awarded a $225,000 contract to Austin Co., 510 N. Dearborn St., Chicago, for construction of a 1-story factory addition.

NORTH AURORA, ILL.—Armour & Co., Pharmaceutical Division, Union Stock Yards, Chicago, will build a $1.5 million plant here.

IOWA

DES MOINES, IOWA—Winston & Newell Co., 300 Sixth Ave. N., Minneapolis, will soon let a contract for a $500,000 grocery warehouse at Delaware Ave. and Washington St. Consulting architects are Brooks & Borg, Hubbell Bldg., Des Moines, and F. A. Constable, San Francisco.

LOUISIANA

JENNINGS, LA.—Farm Machinery & Equipment Co., A. A. Apurry manager, plans a building.

MINNESOTA

ELK RIVER, MINN.—Rural Co-operative Power Association, Maple Lake, has awarded a $528,400 contract to Steenberg Construction Co., First National Bank Bldg., St. Paul, for erection of the substructure for a power plant building.

MISSISSIPPI

YAZOO CITY, MISS.—Mississippi Chemical Corp., Owen Cooper, executive vice president, Jackson, has approved a contract with Girdler Corp., 224 E. Broadway, Louisville, Ky., for contruction of the first $5 million unit of the proposed $12 million fertilizer plant. Portion of the plant to be built by the county under a $750,000 bond issue was also approved. First unit of the plant, a $50,000 administration building, will be advertised for bids about Aug. 20. Herman Dean Jr., Jackson, completing final plans.

MISSOURI

NORTH KANSAS CITY, MO.—North Kansas City Development Co. has awarded the general contract for a $100,000 warehouse to Estrin Construction Co., Railway Exchange Bldg., Kansas City, Mo.

ST. LOUIS—Western Printing & Lithographing Co., Racine, Wis., has awarded a contract to Fruin-Colnon Contracting Co., 1706 Olive St., St. Louis, for erection of a 2-story warehouse and shipping building at 1200 S. Spring Ave. Structure will cost about $200,000.

NEW YORK

BAYSHORE, L. I., N. Y.—Fred T. Ley & Co. Inc. has been awarded the general contract for construction of an addition to the South Side Hospital which will cost over $700,000.

NEW YORK—Dexter Motors Inc., 1892 First Ave., will build a $250,000 garage, shop, office and salesroom at 1800 First Ave. Plans are by William I. Hohauser, 1841 Broadway.

OHIO

CLEVELAND—Cleveland Stevedore Co., W. Ninth St., will build a $200,000 warehouse and auxiliary facilities. Plans are by George S. Rider Co., 3800 Terminal Tower.

CLEVELAND—National Biscuit Corp., 499 W. 14th St., New York, plans to build a $750,000 office, warehouse and baking plant here. Company architect is Roy Wofford, 715 Carnegie Ave.

CLEVELAND—Texas Co., Box 5268, Indianapolis, will build a $1 million warehouse, repair garage, loading platform and office here.

CLEVELAND—Jones & Laughlin Steel Corp. is making extensive alterations to its ammonium sulphate plant at 3341 Jennings Rd.

CRESTLINE, O.—Pennsylvania Railroad is building a $200,000 service facility at Thomas & Bucyrus Sts.

HURON, O.—Eastern States Farmers Exchange Inc. has begun construction of a boiler plant project here.

OKLAHOMA

ARDMORE, OKLA.—Lloyd Noble Foundation Laboratory has plans in progress by Harold Flood, Gilbert Bldg., Ardmore, for a 2-story laboratory.

OKLAHOMA CITY, Okla.—Claud Ray Millwork Co. has completed plans for a 1-story factory and warehouse. Architect is Forrest Butler, 1524 W. Main St., Oklahoma City.

SOUTH CAROLINA

COLUMBIA, S. C.—Office of the Custodian, U. S. Court House, Columbia, will receive sealed bids in duplicate until Sept. 15 for construction of the Veterans Regional Office Bldg. (except elevators and ash hoist) her

TEXAS

AUSTIN, TEX.—City will receive bids Aug. 3 for power plant improvements to main power plant structure. McDonnell Engineering Co Kansas City, Mo., is the consulting enginee

BAYTOWN, TEX.—Humble Oil & Refining C has awarded a $726,000 contract to W. Bellows Costruction Co., 716 N. Everton, fo a warehouse and shop.

BAYTOWN, TEX.—Humble Oil & Refinin Co. has awarded a $269,000 contract t Tellepsen Construction Co., 1710 Telephon Rd., Houston, for erection of a locker roo and work room.

BROWNSVILLE, TEX.—Humble Oil & Refir ing Co. has let a $140,000 contract to W. I Ferguson & Son, 1324 E. Seventh St., fo construction of a bulk plant.

HOUSTON—Hughes Tool Co., 300 Hughes St reports it has not awarded a contract fo plant extension and improvement as e roneously reported in the Aug. 1 issue o STEEL, p. 146.

HOUSTON—Max Lidell, c/o Southern Engi neering Co., 1711 Bell St., will build a $ million truck terminal with auxiliary facil ities.

JOURDANTON, TEX.—Humble Oil & Refin ing Co., Humble Bldg., Houston, has award ed an $85,000 cotract to Hudson Engineerin Corp., 2711 Danville St., for constructio of storage facilities. Humble's own force will work on a $190,000 project to build natural gas pipeline gathering system an install sewers and waterlines.

MIDLAND, TEX.—Pittsburgh Plate Glass Co. c/o T. Jackson, Santa Fe Bldg., Dallas, wil build a $150,000 plant and shop. Architec is W. Ahlschlager, 212 S. St. Paul St. Dallas.

PORT LAVACA, TEX.—Aluminum Co. o America, Commerce Bldg., Houston, ha awarded an $85,000 contract to O'Rourk Construction Co., 4011 Koehler St., Houston for erection of a paste control building.

SAN ANTONIO, TEX.—Dean Specialty Works 907 Roosevelt St., will expand its plant a a cost of $75,000.

SPEARMAN, TEX.—Phillips Petroleum Co. Bartlesville, Okla., has awarded contract totaling $5,425,000 to Starker Construction Co. for additional improvements and ex pansions of a refinery known as the Sher man Plant.

TOMBALL, TEX.—Humble Oil & Refining Co. Humble Bldg., Houston, will spend $350,00 on additional gasoline plant expansions here Humble has awarded a $75,000 contract t Humble Pipe Line Co., Humble Bldg., Houston, for construction of additional gas gathering lines in Tomball field.

WASHINGTON

RICHLAND, WASH.—J. A. Terteling & Sons Inc., Boise, Idaho, has been awarded a $1,060,976 contract to construct a railroad connection between here and the Yakima branch of Northern Pacific Railway, to provide additional facilities for the Hanford, Wash., atomic project.

VANCOUVER, WASH.—Aluminum Co. of America, Gulf Bldg., Pittsburgh, has awarded a $300,000 contract to L. H. Hoffman Co., 715 S.W. Columbia, Portland, Oreg., for construction of a wire, rod and cable mill.

WISCONSIN

MILWAUKEE—International Harvester Co., 1714 W. Bruce St., has awarded a $175,000 contract to Permanent Construction Co., 4100 N. Third St., for erection of a plant addition.

CANADA

EDMONTON, ALTA.—Rule, Wynn & Rule, architects, 300 Birks Bldg., have designed a $500,000 warehouse for Crane Ltd., Jasper Ave. and 109th St.

EDMONTON, ALTA.—Pilkington Bros. (Canada) Ltd., 10364 105th St., will build a $200,000 warehouse and office.

LONDON, ONT.—Gair Co. of Canada Ltd., 745 York St., has awarded a $400,000 contract to Canada Construction Co. Ltd., 131 DeForest Rd., Toronto, for erection of a plant addition.

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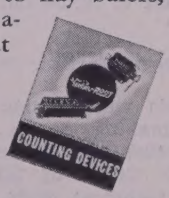

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Behind the Scenes...

L'Odeur Rustique

Opening a letter in the mail the other day, we were assailed by a pungent odor of violets. It permeated our office, reminding us of a balmy spring day even though the temperature at the time was about 120 degrees and the humidity unmeasurable. Smelled like the corner of Sixth & Smithfield, Pittsburgh, in May when Gimbels squirts spring perfume into the air (although that's supposed to be lilac). At any rate, we were anticipating something unusual and we really got it. After we managed to get the piece unfolded, we found it was from Harry Ferguson, Inc., announcing "the Sweetest Manure Spreading Combination You Ever Saw". The photo, of a well-loaded spreader, didn't seem to indicate a strong odor of violets. There were 70 bushels of the stuff aboard, which would probably take care of any violets that might happen to get in the way. Seems like a good stunt, just because it's so different!

Corn Cutting Ahead

We also found in the mail the other day a release from the Department of Agriculture. As yet we aren't just sure whether it was for our information or intended as a subtle sort of warning. There were some horrible conjectures about the future, based on the tremendous surplus of corn which the 1949 crop seems to be bringing with it. The amount of corn produced in America, it appears, is gigantic. It is, according to the D of A, America's largest crop. If people don't stop producing so much, this item goes on to state, there will be much trouble ahead. It hints darkly of government controls, limits to the amount which can be produced. That's for 1950, so if you folks suddenly wake up some Monday next year and note that the space occupied by this colyume has been substantially reduced, you may be able to figure out the reason.

Steel in STEEL

This week starts another in our steelmaking series — this one on structural steel, including rails, by F. D. Gillies of Inland. Next week our technical staff presents an interesting article on steel specifications from the consumer's standpoint, which is the answer to recent material outlining the producer's point of view. Every week there is basic market material on steel products, broken down by products and by principal consuming and producing centers. We list these things as a few of the reasons why we are building a larger group of readers all the time where the steel industry is of prime importance. Your group, friends, is now larger than it has ever been before in the history of this publication. And we like it!

Help Wanted

We have a pleading letter from South Africa which some good reader of STEEL may be able to answer. It's from Miss P. M. Speight, of the Public Library of the City of Johannesburg, Market Square, Johannesburg. Miss Speight says she is greatly distressed to think that their permanent reference file of STEEL is incomplete. Some citizen has spirited away the only remaining copy of our issue of May 4, 1942, and we haven't any copies available here. Miss Speight says she will happily pay any expense necessary to secure same, so if any of you readers might know where a copy could be obtained, let her know. Or, send the copy to us and we'll forward it over to Boerland. If you can lay hands on a copy, send it to Shrdlu, STEEL, 1213 West Third St., and we'll have a special letter of thanks bearing South African postage in your hands post haste.

Market Is Dead

If any of you readers know where in the metalworking industry you can sell vibrating tables used for jiggling corpses, let us know. We know an outfit which makes these items, as well as a piece of equipment designed to reach the top of hearses. They would like to know if there's any market for their products in the metalworking field. Anyone who has any ideas is welcome to address them to us. Please omit all references to members of Congress, corporate directors, and sales managers.

Shrdlu

(Editorial Index—page 23)

STEEL

Vol. 125—No. 8 August 22, 1949

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Published by THE PENTON PUBLISHING Co., Penton Building, Cleveland 13, Ohio. E. L. SHANER, Chairman and Treasurer; G. O. HAYS, President; R. C. JAENKE, Vice President; F. G. STEINEBACH, Vice President and Secretary. Member, Audit Bureau of Circulations; Controlled Circulation Audit, Inc.; and National Publishers' Association.

Published every Monday. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10; two years $15; all other countries, one year $18. Single copies (current issues) 35c. Entered as second class matter at the postoffice at Cleveland, under the Act of March 3, 1879. Copyright 1949 by the Penton Publishing Co.

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